COAL AGE

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A Reward for Bravery

Is it not about time that some one was suggesting a suitable method of rewarding the individual bravery displayed in mine rescue work?

THIS thought took possession of us in reading some of the accounts of results obtained by the German Kaiser in distributing Iron Crosses to his soldiers.

Following each mine disaster there is a call for volunteers and as a rule the call is not in vain. The men who willingly risk their lives at such times are not fired by patriotic motives such as move soldiers to enlist for the protection of a Fatherland, but they are carried forward by humanitarian impulses which they do not stop to question.

Such promptings do not incite sensible men toward acts of foolhardiness, but affect such men exactly as does the call of patriotism; and the same rewards that are suitable for patriotism can be safely applied to them.

In considering the possibilities of such a system, we should not lose sight of the fact that at the present time there is little co-operation between first-aid teams in different states or even in different sections, and this condition is also true to a degree between outsiders and the rescue men in the employ of the Bureau of Mines. Very often jealousies spring up when several different crews offer their services simultaneously, and as a result things happen that not only affect the efficiency of the rescue work, but often endanger unnecessarily the lives of the men.

In working up a system of rewards, opportunity would be presented for perfecting a National organization to deal with just such problems, since the prestige offered by recognition from a National body would appeal to every one, and make such an organization possible.

It might be that nothing more binding than precedent could be offered in lieu of fixed rules and regulations to govern rescue teams in different States and the U. S. Government men, but even well-established precedent openly published would be better than the present uncertainty.

It is a fact that just now any coal operator might feel justified in preventing even a U. S. Bureau of Mines instructor from entering his mine, following an explosion, if he felt so inclined.

First-aid contests offer some encouragement and are an incentive to men hesitating about spending the necessary time required to complete a course of rescue training; however such contests can never appeal to a fellow's imagination as would medals won by acts of bravery in actual service.

But a first-aid meet provides an excellent opportunity for the display of honors won, and even heroes enjoy the experience of receiving public approval.

WON'T *Coal Age readers make suggestions as to some feasible plan for properly rewarding the brave men who do deeds of heroism in our coal mines*

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A Tour through European Coal Mines--III

By Samuel Dean*

SYNOPSIS—Belgians recommend stone dusting. Systematic timbering generally employed. Miners' wages much less than in America. Girls employed to pick slate.

With regard to mine fatalities in Belgium, a paper was issued recently by Messrs. Watteyne and Breyre, in which it was shown that fatalities decreased continuously from 1881 to 1910, until the rate was 0.992 per thousand employed (inside and outside included), which is a world's record.

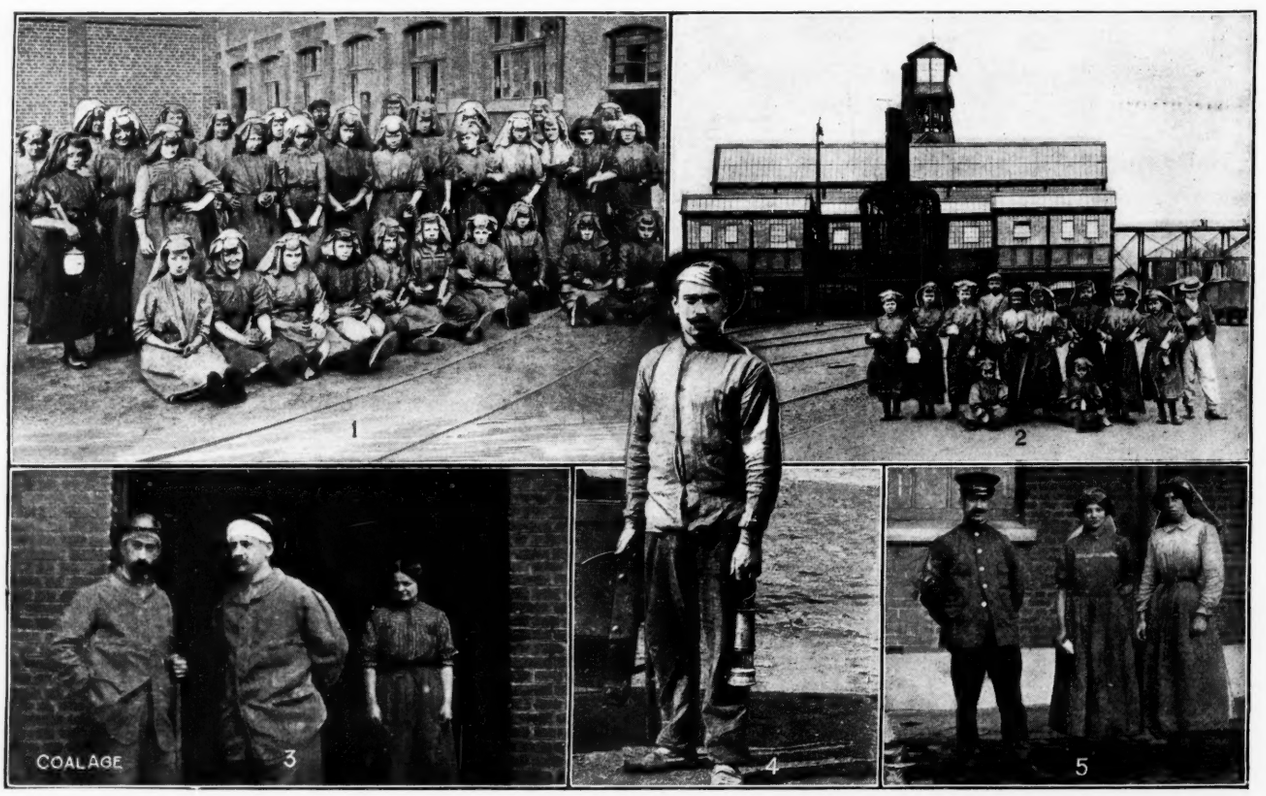
There was a remarkable diminution in fatalities caused by ignitions of firedamp and coal dust, the figures being 0.437 per thousand between 1881 and 1890, 0.28 between 1891 and 1900, and 0.077 between 1901 and 1910. The causes of accidents in connection with gas and dust, in the last period of 10 years, were: Ignition by electric lamps, 0.011; explosions, 0.025; asphyxia by normal evolution of gas, 0.014; sudden outbursts, 0.027.

The authors of the report attribute these results to the use of permissible powders, which have been used to a much larger extent than the law demanded. Strong warnings were issued against exceeding the charge limit of these explosives.

Prevention of Dust Explosions

For the purpose of reducing accidents due to explosions of coal dust, Watteyne strongly recommends local and concentrated schistification (shale dusting and arresting barriers), the use of lamps having a high degree of security, and of explosives of proved safety in the presence of both gas and dust.

Four years ago Lemaire experimented with incandescent lamp filaments at the Frameries testing station in Belgium, and proved that breakage of the globe, with either carbon or metal filament, was dangerous in an explosive mixture. Tests were made with 2- and 4-volt lamps in currents containing 7½ to 10 per cent. of methane, and having speeds of 2 to 33 ft. per second.



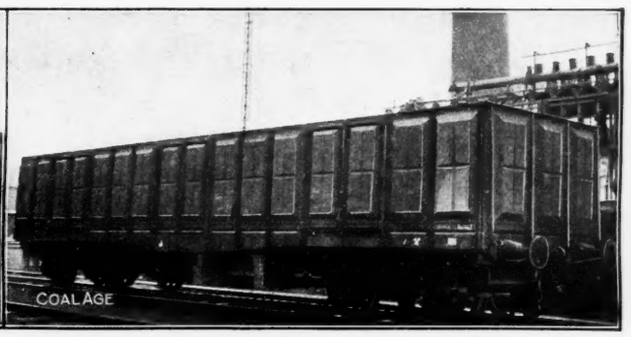
1—Girls Employed as Slate Pickers. 2—Another Group of French Women Who Work as Slate Pickers. 3—French Bosses. Note the Linen Cap Worn under a Leather Hat. Woman on Right Is the Bath Attendant. 4—Typical French Miner. 5—First-Aid Man and Slate Pickers

Methods of Working in Belgium

I am only able to deal briefly with methods of working coal seams in Belgium; no matter what the system is, the goaf is always packed tight with rock or other material. The practice of hydraulic filling has increased every year, and the same may be said concerning Germany and France.

*Delagua, Colo.

GALVANIZED-STEEL CARS USED IN FRENCH MINES



40-TON COAL CAR USED ON FRENCH RAILROADS

The method of working a 9-ft. seam of coal near Lens, in France, may be of interest. The seam is first blocked out in pillars 300x900 ft. (Fig. 1), the single headings, 9 ft. wide, being ventilated by means of 2-ft. diameter pipes and small fans driven by compressed air. Slices of coal 9 ft. wide are taken off the pillars until all the coal is removed, these 9-ft. places being driven to the rise as the goaf formed by the previous slice is filled with rock (Fig. 2).

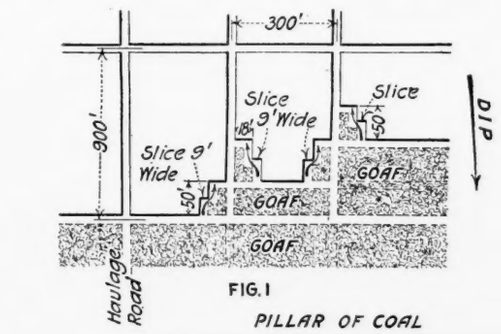


FIG. 1

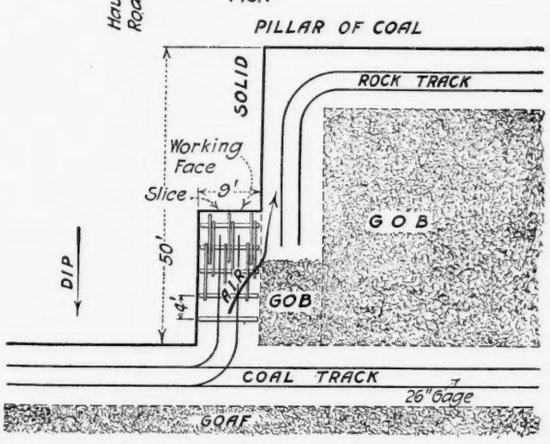


FIG. 2

SHOWING METHODS OF MINING IN FRANCE

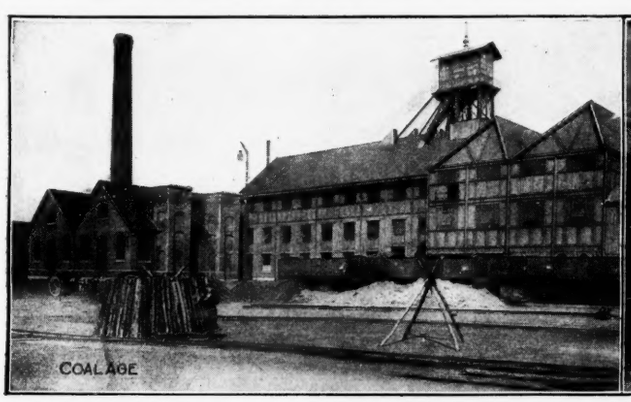
TIMBERING KEPT CLOSE TO FACE

The cars containing the rock are brought down hill from another district, or another mine, and in some instances from the surface. The cars containing the coal also travel down hill to the shaft bottom, the haulageways being so arranged that the grade is always in favor of the loads. The roof is supported by cross-bars 4 ft. apart with three lagging pieces overhead, these pieces being driven ahead as the face advances, after the manner of forepoling, until there is room for another cross-bar against the face 4 ft. from the last one. Thus the miner never works under wholly unsupported roof.

This is the general method of timbering at the face in the mines of France, and the term "systematic timbering" sprang into prominence after a visit which Henry Hall, a British mine inspector, paid to French mines many years ago; but even today no systems of timbering, anywhere, are in advance of the French method, and it may be added that few, if any, are more costly. But the condition of the mine roofs justifies this elaborate system of timbering.

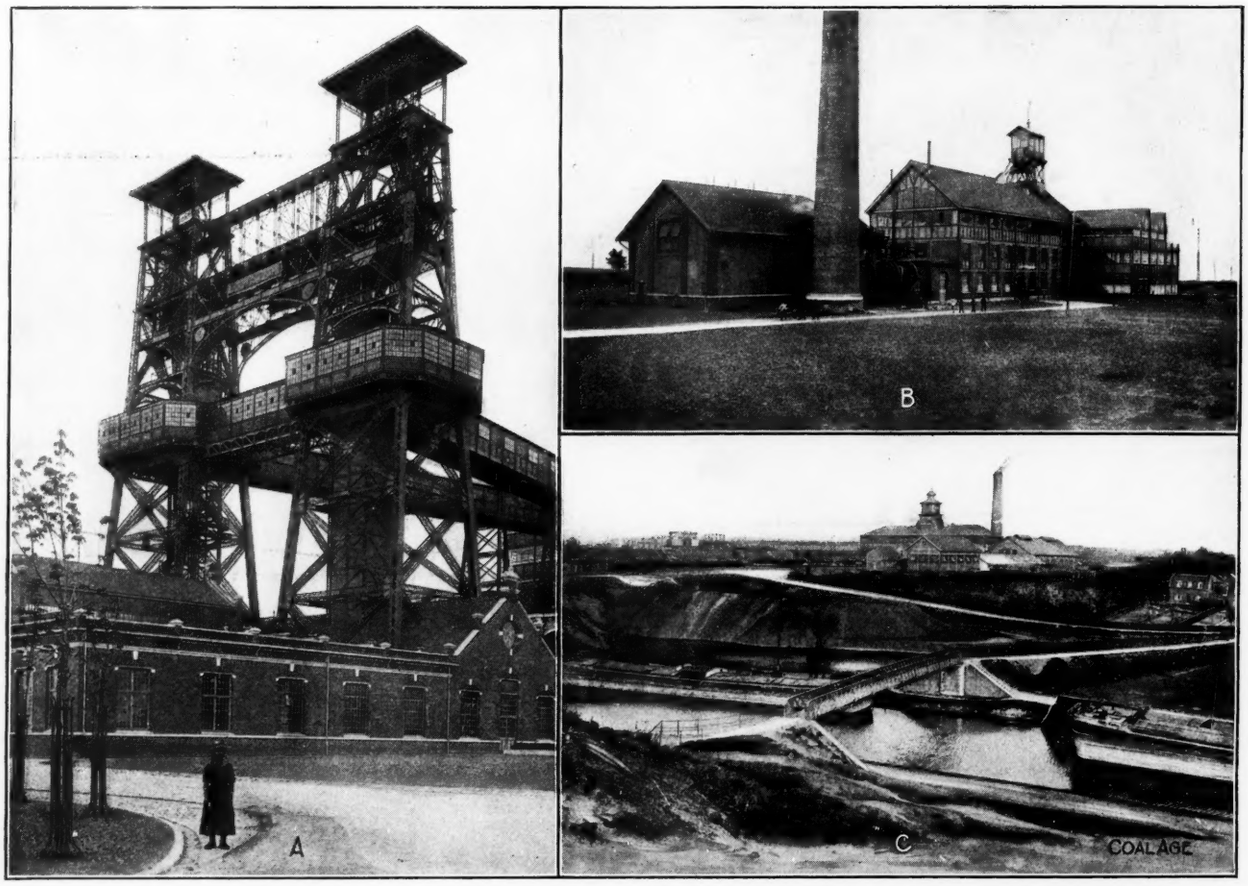
WAGES PAID MINERS

In this 9-ft. seam, the miners are paid 32c. a ton for mining, loading, timbering their places and laying track. The capacity of the cars is 1200 lb.; they are of galvanized steel and being without end doors are consequently dust-proof.



COLLIERY NO. 12 AT LENS, FRANCE

CONVEYING CARS UNDER TIPPLE



A—Steel Headframe at No. 15 Colliery, Lens, France. B—No. 14 Colliery of the Coal Mining Company of Lens. C—No. 8 Colliery at Lens

Miners average about $1.50 a day (8 hours). Contract company men average about $1.25 a day; these men are paid 20c. per cu.yd. for packing the goaf with rock, which includes hauling the material from other parts of the mine.

Props and cross-bars are not withdrawn from the goaf, and timber costs are often more than 25c. per ton.

Laborers on the surface are paid $1.20 per 10-hr. shift.

The workmen are provided with attractive, well built homes, each house having a large garden. House rent is surprisingly low, being only $1.30 per month for a five-roomed house with garden and necessary out-houses. Workmen are supplied with free coal.

A single man can get room and board for 40c. a day, so that although wages are low, the cost of living is correspondingly cheap, and to me there is always something strange about this, because some foodstuffs are imported, freight rates are high, and the cost of fuel in the country is high. The selling price of coal at the mines is $4 and over per ton.

Amusement Hall for Employees at Lens

No. 13 Colliery at Lens, France

There was a shortage of miners in France, and in the Lens district 25 per cent. more men were needed.

Girls are employed picking slate in the screens, and also work in the safety-lamp rooms. In this connection it may be said that the famed beauties of Paris do not compare with the unadorned beauty seen on the tipples, but as far as I could observe, there was no levity, or lack of discipline at the mines.

Unique Surface Plant

A photograph is shown of the steel headframes over the pits at the No. 15 colliery belonging to the Mining Company of Lens. There are two shafts, upcast and downcast, each 16 ft. diameter circular, and 82 ft. apart. These were sunk by the freezing process and are about 1000 ft. and 850 ft. deep, respectively.

Electric hoists have been installed and the whole of the machinery on the surface is operated electrically.

The mouths of the shafts are 82 ft. below the level of the railroad tracks, and lattice-girder bridges, 106 ft. high, communicate with the screens over the tracks. The bridges are covered with metal panels and glazed windows. The height to the top of the pulleys in the headframes is 214 ft., and to the top of the roofs over the pulleys, 230 ft. The cars are hauled to and from the screens by means of an endless chain.

Modern Shaft-Sinking Methods

I cannot close this article without referring to the excellent work done in recent years by the technical mining men, in connection with shaft sinking through heavily watered, and sandy running strata. In 1904 an engineer named Portier successfully applied the cementation process for stopping fissures in the chalk sides of a shaft in the North of France, and since then this method has been successful in different parts of the world. Cementation has also been resorted to for insuring the success of the freezing process.

Extracts from a Superintendent's Diary

About once a year we manage to have an entertainment that is intended for and is embraced by most of the families of our community. It may be an open meeting of one of our lodges, or a church festival, or a union celebration; be that as it may, word travels out that everyone is to have a good time, with plenty to eat and everyone proceeds to come.

There have been times when we have had several open entertainments in one year, but, as a rule, one only succeeds. The reason for this is not very difficult to discover.

The women of our community, like the women in all other mining villages (and men, perhaps, if the truth were known), have a desire to display their finery to all of the other women of the community and likewise crave an opportunity to examine the "fine feathers" of the other women.

An open entertainment naturally offers the best opportunity for such display, and as most of these women must content themselves with one "dress-up" dress each season, one entertainment per year suffices.

Nor are dresses the only things that are subject to "dress parade" during these gatherings. Some sort of informal supper is generally served and this gives each of the ladies a chance to contribute her favorite omelet, or cake, or pickle for the approval of the camp's fastidious epicures and in return she is allowed to pass judgment on her neighbors' offerings.

It always happens that there are plenty of children on hand to devour the pies, cakes and jams; a fortunate circumstance since there are generally a dozen dessert courses to each meat and sandwich offering.

Some of the men in attendance begin to pass knowing winks down the line as soon as the kids get interested in the pies to such an extent that their mothers find it necessary to watch them; a few moments later groups of thirsty men spring up outside of the hall and a bottle or two is quickly emptied.

These old offenders always manage to get back before they are missed, however, and while the children are gobbling up the last piece of pie, they manage to empty all of the pickle dishes.

After the tables are cleared, further opportunities for displaying and comparing talents are offered.

Songs, recitations, impromptu speeches, musical numbers, etc., are called for and every one is given a chance.

One of the circumstances that adds to the interest of these gatherings is the number of different nationalities represented. This fact leads to heated and yet withal interesting discussions as to how this or that would be done in the old country, and the various viewpoints suggested preclude the possibility of any one going away with too high an opinion of himself.

For two weeks our camp has been making preparations for the first open meeting of our first-aid organization, which is to be held tonight. As this happens to be the first suggested entertainment of the season, word has gone out that it will be the event of the year. Since the first-aid team will, no doubt, insist on giving a little exhibition, we will have oratory, mirth, and music alternating with demonstrations of how to handle the wounded and the dying. And no one will consider the program unusual or out of tune. We take our pleasures seriously and can even find entertainment in criticizing methods of assisting the wounded.

New River Operators Honor Retiring Officers

As a compliment to the retiring president, Wm. McKell, and the retiring secretary, W. R. J. Zimmerman, the New River Coal Association served an elaborate banquet at the Dunglen Hotel, at Thurmond, on the evening of Jan. 5, when a handsome and beautifully engraved gold watch was presented to each of the retiring officers. A large number of the members of the Association were present. The presentation addresses were made by Hon. Jos. H. Gaines and R. S. Spilman, of Charleston, the former also acting as toastmaster.

Happy after-dinner talks were made by Hon. C. W. Dillon, on "How Legislatures Do So Much," Hon. H. W. McGinnis on "Raleigh County," John Laing on "Safety First," R. T. Hubbard, Jr., on "The Law and the Profits," and Attorney-General A. A. Lilly.

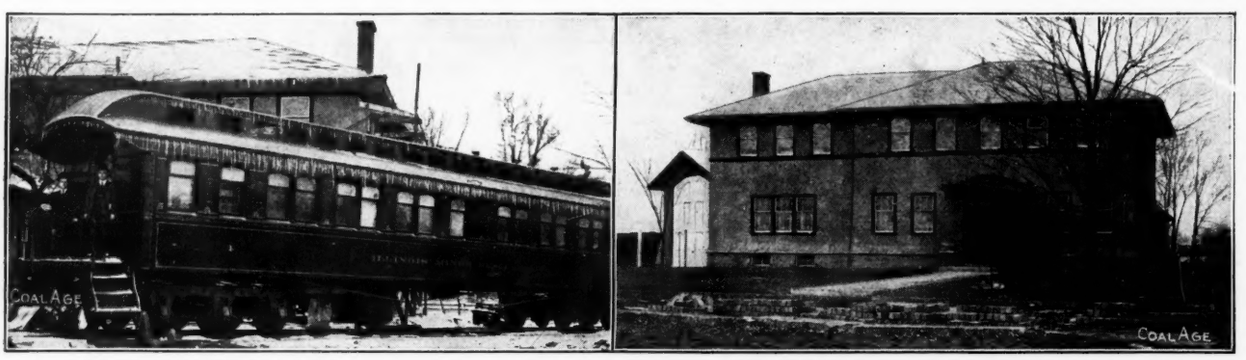
The newly elected officers of the Association are C. C. Beury, president; Wm. McKell, vice-president; N. S. Blake, secretary and treasurer.

Rescue Operations after Royalton Explosion and Their Lessons

By Oscar Cartlidge*

SYNOPSIS—The rescue work at the Royalton explosion was performed almost entirely by the aid of breathing apparatus, the wearers utilizing their outfits for almost the full time limit. The only failure was due to a chance being taken with spent apparatus. Crude American soda was used in the Fleuss apparatus instead of the imported article. Need for more safety lamps and electric lamps and better identification tags was made manifest. By reason of the use of breathing apparatus and the absence of fire, the mine was practically recovered in less than 20 hours.

The recovery of the mine after the explosion at Royalton was the occasion of much successful work, conducted largely by men in breathing apparatus, the bodies of all but about thirteen of the total of fifty-two having been carried back to the base by men so equipped. This work was done by the rescue teams of the Illinois Mine-Rescue Commission and of the Madison Coal Corporation. The cars of the Bureau of Mines took no part in the work.



The Benton Mine-Rescue Car and Rescue Station

This is stated to show that the hope of the director of the federal bureau has been fully justified, and Illinois is now in position to give adequate assistance in case of such unfortunate disasters. The rescue work proceeded without a hitch, and the apparatus proved to be equal to the full time of service for which it was rated.

The explosion in the North Mine at Royalton, Ill., Oct. 27, 1914, occurred at about 7:35 a.m., just after the men—in all 346—had been lowered into the mine for the day's work. A few were still on the bottom, and others were on their way down the entries to their respective working places.

A Few Preliminary Facts

Charles A. Sine, general superintendent, had just reached the bottom on a tour of investigation, and. strange to say, he was only bruised and shaken up while others near-by were killed. He was out directing the work of mine recovery on the following day.

*Manager of mine-rescue stations of Mine-Rescue Station Commission, Springfield, Ill.

NOTE—A detailed account of this explosion appeared in our issue of Nov. 7, 1914.

The mine is about 325 ft. deep, has been in operation nearly five years and has an average output of 3000 tons per day of eight hours. It is worked by the room-and-pillar method. The coal is about 9 ft. thick, 7 ft. being taken in the advance and the remaining 2 ft. of top coal being drawn after the rooms are extended their full length.

The explosion was confined to the northwest section of the workings, and presumably was the result of a body of gas being ignited by coming in contact with an open light, as safety lamps were not used.

The call for help reached the Benton station, through State Inspector of Mines George L. Morgan, at about 8 a.m. Benton is about 20 miles northeast of Royalton, and the roads being good, the trip was made by automobile, part of the crew arriving and being in the mine at 11 a.m.

Many Lives Saved by Reversal of Air

Preceding their arrival, the mine manager, James Brown, and others, who were on top at the time of the explosion, descended into the mine and brought out the wounded and those in the unaffected area. Before going below, Mr. Brown, we understand, had the air reversed, making the hoisting shaft the downcast. At the time of the explosion the air was being forced into the mine at the escapement shaft.

I have no personal knowledge of the manager's reasons for this action, but I assume that he knew in what part of the mine the explosion originated and also that there were many men at the shaft bottom and along the main entry on the way to the interior. I have no hesitancy in saying that this reversal of the air current saved many lives. Two men, however, found near and to the east of the escapement or first and second west may have perished because the direction of the air was changed. An inspection of the map will show that reversing the air caused the noxious gases to return directly to the air shaft, principally over that part of the mine that had been worked out and abandoned.

Details of the Rescue Work

In the first party that descended into the mine at 11 a.m., was W. L. Morgan, inspector; Edward Laughron, county inspector; James Brown, mine manager; Dr. Springs, colored;

Shep Clayton, miner; James Towal, superintendent, Benton Rescue Station; M. J. Carraher and Walter Nichols, assistants of the Benton Station. The three latter carried breathing apparatus. All in the party were able to get to within one hundred feet of the air shaft by the heading on the west side of the shaft. At this point they encountered bad air, whereupon Messrs. Towal, Carraher and Nichols explored to the air shaft with apparatus, but discovered no bodies.

They then all returned to the main shaft; went up the main east entry to the main north, and up the main north to the fourth west off the main north. Up to this point ventilation was fairly good and but little disturbance evident, except at the east side of the shaft bottom, where a large pile of rubbish had been thrown up against the loaded cars. This material had evidently come from the west.

Clothes Completely Stripped from Victims

Leaving the rest of the party at the fourth west off the main north, where foul air was again encountered, the men with breathing apparatus proceeded up the fourth west to a point about one hundred feet from the first north off the fourth west, where one body was found, and about fifty feet inbye, two more. The clothes were stripped completely off the bodies, except that the trousers of one man were still hanging over the shoes.

At the first north off the fourth west they found a car turned upside down with two bodies, much mutilated, lying on top. Another body was found inside of the second north.

The rescuers next explored the crosscuts between the first and second north and carried three bodies to the fourth west, where men without breathing apparatus took them to the shaft. This party then returned to the surface, and the rescue team of the Madison Coal Corporation, Dewmaine, John Lyons, captain, having arrived with its equipment, a first team composed of Towal, Carraher, Dixon, Hudson and George Clayton, and a second team comprising Nichols, Lyons, Hawley, Hooper and Bass (the last three colored) proceeded to a point where the first two men were found. Here a base for further operations was established.

Supporting this breathing-apparatus squad, was a crew to re-establish ventilation temporarily. This included James Dunn, Thomas Carraher, E. Laughron, A. J. Skelton, James Brown, Shep Clayton, John Duncan, R. P. Medill, Thomas Watts, Evan D. John, John Eddy, Bernard Cosgrove, Charles Story, John Nutall, James Forrester, William Burton, George Bagwill and Dr. Springs, all mining men in the southern end of the state.

Before going inside, a curtain was hung on the west side of the shaft across the main entry, one in the "forty-five" to the east of the shaft, and a regulator curtain was placed in the main east at the first south, for the purpose of forcing more air to the base of operations.

More Rescuemen Available Than Needed

At about this time I arrived from Springfield. After consulting with the state inspector, the superintendent of the Benton station and the mine officials and learning that everything was progressing favorably, I concluded that we had enough rescuemen and equipment on the ground, counting the team that was on the way from Eldorado. It did not seem necessary to send for any of the state rescue cars. Subsequent events proved that this conclusion was justified.

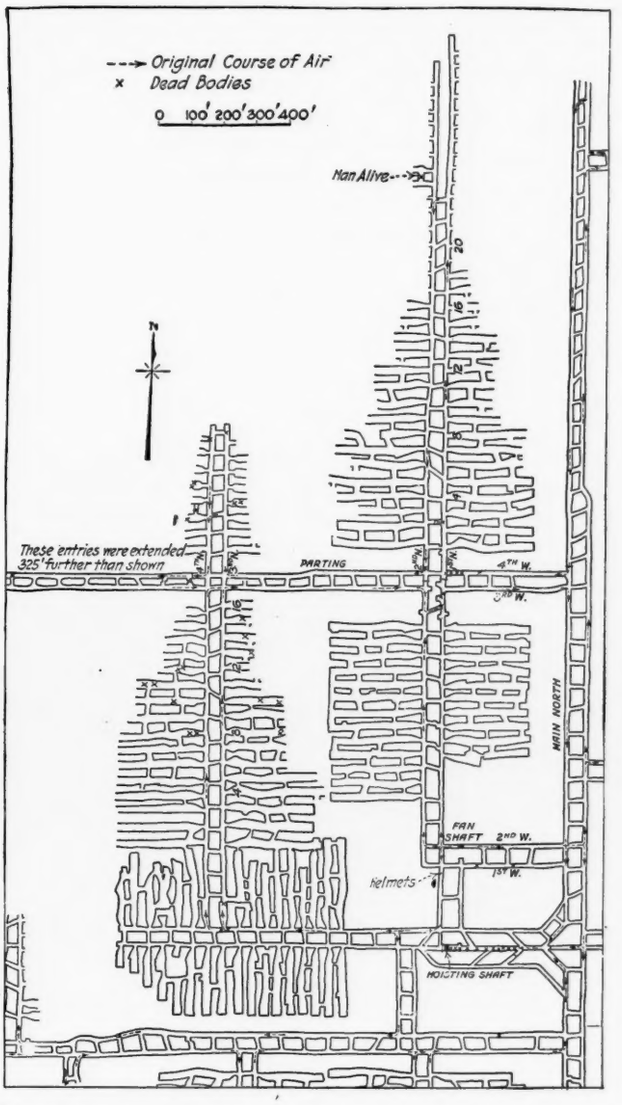
No one had at that time done anything to make stoppings of any permanence, and there was a dearth of lights, so we busied ourself in securing men to tighten stoppings, in procuring lights, extra oxygen, soda, etc., leaving Mr. Towal in charge of the inside rescue crews, while we alternated between the inside and back work.

Up to the point where the base was established the ventilation had been made fair with temporary stoppings. The first team donned breathing apparatus and explored the fourth west to the fourth north, went up the latter and out by the third north. Eight bodies were found on this trip.

Trips Occupying about 1¾ Hr.

The rescuers then ventured down the fourth south a short distance and then retreated by the third west to the base. No more bodies were seen. The parting on the fourth west was nearly blocked with cars, and much violence was indicated; the force of the explosion traveling toward the east in the third and fourth west, and toward the south in the third and fourth south. This fact suggested to us that the origin was probably in the third or fourth north. The trip occupied 1 hr. 45 min., and satisfied everybody that no fires resulted from the explosion.

The second team was then sent up the first and second north. This team explored all the rooms on the first that were standing, there being 35 turned. They then inspected 10 rooms on their return down the second north. In the crosscut between Rooms 25 and 24 of the latter heading a man who was still alive, but in a dazed condition, was found reclining on his powder box. His carbide lamp was burning at his side. Two of the squad returned to the base for assistance and carried the man to the first north where there was better air, due to the work of the temporary ventilation squads. He was brought out, and, I understand, has recovered. The man found at the door between the first and second north had a pinkish color, and the pulmotor was tried on him for possible signs of life, but to no avail. On this trip the men in the breathing apparatus traveled for 1 hr. and 40 min. in their helmets. While the rescue teams rested, the temporary ventilation squads worked in the first south and found three men.



Map Showing Where the Bodies of the Victims in the Royalton, Ill., Explosion Were Found

The breathing-apparatus squad reported that all stoppings between the first and second north were intact, and after the air had been turned into them, Messrs. Dunn, Johns and party explored the balance of the second without finding any dead.

A third breathing squad composed of part of the Dewmaine team and part of the Benton team explored to No. 12 room on the fourth south. On this trip three bodies were found, one at No. 13 under a car and two in No. 14. Four more were found later, farther in. It was now about six o'clock and the teams rested; the ventilating squads working up the fourth west.

One Man Suffers from Use of Depleted Apparatus

A mixed breathing squad composed of Dewmaine, Benton and Herrin men then carried bodies out of the third and fourth north to base, and then explored to face of the third and fourth west. This pair of entries is about 325 ft. farther

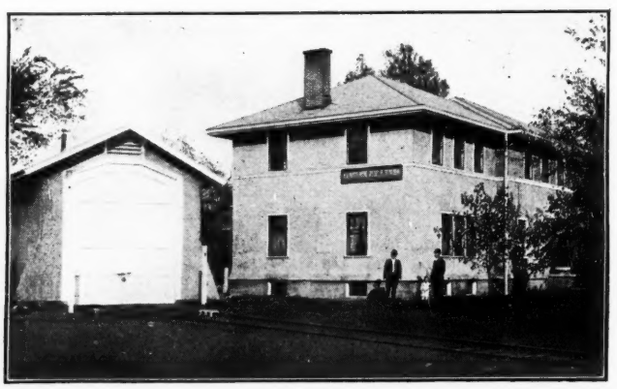
in than the map indicates. Two bodies were found about three hundred feet from the face, and the squad carried them out, four men being detailed to each stretcher.

Nichols and team then started to explore the third and fourth south but only got a short distance when one of the team became sick and the men returned to the base. This sickness was due to using an apparatus that had previously been in service and in which the chemical had not been renewed, as it was thought that it would last for the short trip contemplated. Leaving the one man the other four returned and explored the fourth south returning up the third south. The O'Gara Coal Co.'s team having arrived from Eldorado, was then sent in under the captaincy of W. G. Taylor, to explore the rooms in the third and fourth south. They discovered and brought out eight bodies.

This ended the exploration of all the explosion area except the escapement entries. Fresh air was turned down this pair of headings, and two bodies were found. One near the escapement shaft and the other about one hundred feet outbye. One body was also found in the sump at the main shaft.

All But about Thirteen Bodies Recovered by Apparatus Men

It was now 5:30 a.m. of the day following the explosion. Forty-seven dead bodies had been removed from the mine by the rescuers, and all but two or three of those inside had been carried to fresh air by men wearing breathing apparatus. According to the records of the company two were still missing, but it was certain that if there were any others in the mine they were not alive. It not being necessary for breathing apparatus to be used further the general manager informed us that his men could handle the rest of the work, and the mine manager organized regular shifts for the cleaning up of the mine, with competent men in charge, and, while



The Car Shed and Rescue Station at Benton, Ill.

this was in progress five bodies were found. We stayed at the mine all of Oct. 28, and upon leaving left Mr. Nichols to stay as long as the mine manager wanted him.

The dead were located as follows: Ten at the shaft bottom; 5 in fourth west up to the first north; 3 in the first and second north; 3 in the first south; 8 in the third and fourth north; 2 in the third and fourth west, past second north; 8 in the third south; 7 in the fourth south; 2 in the back west at third south; 2 in the first west or escapement road; 1 in the first west off the main south; 1 in the sump. This totals to 52 men.

The barometer at Royalton, at 7:30 a.m., registered as follows, the readings being corrected to a sea-level basis: Oct. 26, 29.98 in.; Oct. 27, 30.42 in.; Oct. 28, 30.15 in. This indicates a rise of 0.44 in. in the 24 hr. preceding the explosion.

Conclusions

This was the first large explosion in Illinois since the establishment of the state mine-rescue stations, and we believe the exploration of the mine and the recovery of the dead in less than 24 hr. after the explosion occurred justify the efforts put forth by the Mine-Rescue Commission for the propagation throughout the state of mine rescue and first aid.

We have demonstrated the fact to our own satisfaction that breathing apparatus worn by trained men is of great value in exploration and the recovery of the dead after an explosion. It has been shown that the types of breathing apparatus used are practically safe when worn by experienced men, and that long exploration trips to locate the dead and living and ascertain the presence or absence of fires can be made in irrespirable air. We also found that crude caustic soda can be used for rescue work with the Fleuss apparatus, for our men used this absorbent exclusively.

We learned that there are not enough safety and electric lamps at the average Illinois mine, and suggest that every mining man who goes to an explosion should take with him all the lamps he can secure. We also learned that the reversal of the air current after an explosion is sometimes justified.

Every miner while underground should have fastened to his person an identification tag. Some of the bodies were practically without clothing, which goes to show that checks or other identification marks carried in the pockets are not reliable.

Two of the Eldorado team used Draeger 2-hr. apparatus, all the rest of the teams being equipped with the Fleuss outfit, designed for equally extended time of service.

All the men who wore the breathing outfits are, I believe, with the possible exception of Mr. Lyons, holders of Illinois Mine-Rescue Commission certificates.

In addition to the men previously mentioned in this article, much credit is due to James Reid and John McClintock, state mine inspectors; James Seymour, Joseph Morris and George Morris for their valuable assistance and advice.

Ventilating the Face of Entries

By M. D. Cooper*

When driving two parallel headings, ventilation is secured in both by making one the intake while the other acts as the return. At intervals, break-throughs are driven through the coal separating the headings, in order that the air current may travel from the intake to the return heading. As the work advances and a new break-through is completed, the preceding break-through is closed with a wooden, brick or concrete stopping. At times it becomes impossible to properly ventilate a heading by means of break-throughs alone, in which case a brattice must be constructed.

A good type of brattice is a partition of brattice cloth carried up from the last break-through. At that place, a door is hung across part of the entry in order to force the air current up one side of the brattice and back on the other side.

In Fig. 1, which shows the general arrangement for ventilating both headings in a two-entry system, the right entry is the intake, while the return air goes out through the left entry. Just outside of the break-through, a door *A* is located in the right entry. A line of posts is set from the door to a point about 20 ft. from the face. To the posts 6-in. ship-lap is nailed and the brattice cloth nailed in turn to the boards. The posts may be spaced according to the length of the boards, but in general if the distance between posts much exceeds 10 ft., the boards can-

*Ellsworth, Penn.

not be rigidly fastened and it becomes increasingly difficult to tighten the brattice to the roof.

The air travels as indicated by arrows between the brattice *B* and the right rib, sweeps the face, returns between brattice *B* and the left rib, passes through the break-

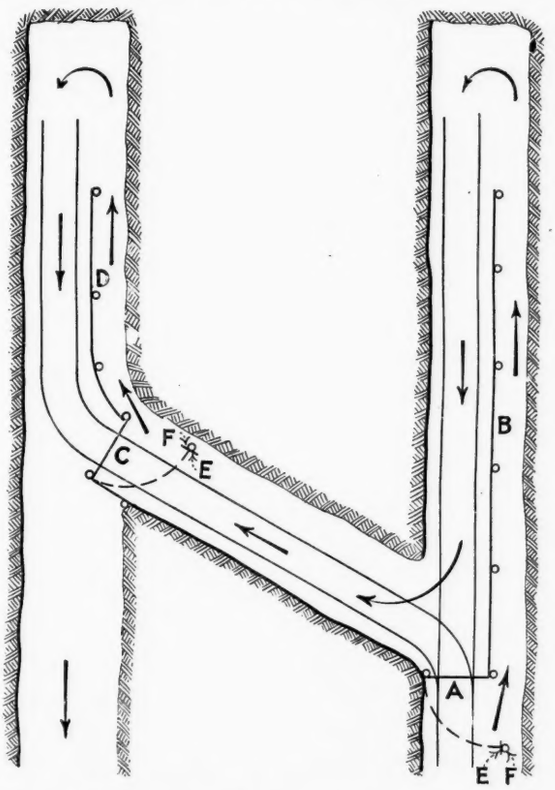


FIG. 1. VENTILATING ARRANGEMENTS OF THE TWO-ENTRY SYSTEM

through, up along brattice *D* to the face of the left entry, and then out the left entry.

In order to give a reasonable area on the narrow side of the brattice, it is best to have the entryman lay his track as near the rib as possible, while giving sufficient clearance for his cars. The air may be directed up either the wide or the narrow side of the brattice, but it is generally better practice to cause the intake air to travel the narrow side, as the restricted area increases the velocity of the air current, making it unnecessary to carry the brattice so close to the face as in locations where the

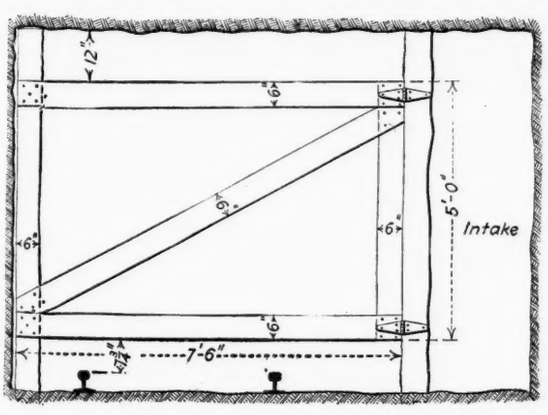


FIG. 2. A BRATTICE DOOR

intake must be the wide side. This results both in a saving of brattice and in giving greater freedom of movement to the entryman and machine runners.

BUILDING THE MINE DOORS

For use at *A* and *C*, Fig. 1, a simple door built of shiplap, and intended to be covered with brattice cloth, is shown in Fig. 2. This door is suitable for an entry 7 ft. high and 10 ft. wide, in which the track gage is 42 in. In building the door it is best to cut off the necessary boards to the required length, place the side boards across the track and the top and bottom boards in position over the first two. Then drive one nail in each corner, square the door by moving the corners until the diagonal distances are equal, attach the diagonal board, and tighten the door by driving three or four 6-d. nails into each corner and bending the points over. The post to which the door is hung must be slightly inclined toward the face of the entry in order that the door may swing closed by gravity after it is released.

The door is held open by means of a button *E*, Fig. 1, this being a short board attached by a 20-d. nail to the post *F*. Galvanized-iron strap hinges are used for attaching the door to its post, and it is better practice to use two or three 6-d. nails in each hole in the hinge, rather than one larger nail, for by so doing much time is saved when it becomes necessary to remove the hinge from the post.

If the height of the entry exceeds the width of the brattice cloth, the space between the boards supporting the cloth and the roof may be filled by cutting off strips of cloth of the proper width and fastening them by means of short sticks. The sticks are nailed to the boards at intervals of from 12 to 18 in., as shown in Fig. 3.

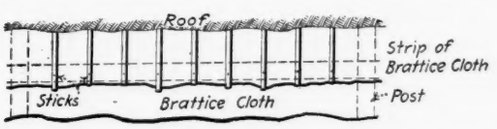


FIG. 3. METHOD OF EXTENDING THE BRATTICE TO THE ROOF

A brattice of this kind, if carefully erected, will prove quite satisfactory in conducting the air to the face. Moreover, when a new break-through is finished, the material may generally be recovered and used a second time.

Anthracite Shipments in 1914

Statistics show that the total shipments of anthracite from Pennsylvania last year were 68,342,601 long tons. This is 727,027 tons less coal than was shipped in 1913.

Total shipments of anthracite last month were 5,702,258 tons as against 5,662,618 tons in December, 1913, an increase of 39,640 tons. The amount of coal on hand at tidewater shipping ports decreased 141,365 tons, from 811,198 tons on Nov. 30 to 669,833 tons on Dec. 31.

The Lehigh Valley led in tonnage for the month with 1,055,349 tons; the Philadelphia & Reading was second with 954,827 tons; and the Lackawanna was third with 902,140 tons. The Central Railroad of New Jersey carried 710,604 tons, the Erie 703,037 tons, the Delaware & Hudson 641,952 tons, the Pennsylvania 530,200 tons and the New York, Ontario & Western 204,149 tons.

Coal Mining in Ohio during 1914

By J. M. Roan*

SYNOPSIS—Detailed account of the activities of the Industrial Commission of Ohio, Department of Inspection, Division of Mines, for the fiscal year ending Nov. 15, 1914. More than two-thirds of all accidents attributable to falls of roof.

The Mining Industry during the latter months of the year 1913, showed marked activity, and all indications pointed to a prosperous trade in the coal business for the year 1914. The mines during the early part of the year 1914, worked almost full time. On Apr. 1, 1914, the wage agreement between the miners and operators expired, and a large number of the mines in the state suspended operation until a new wage agreement could be entered into.

Run-of-Mine Law

The Run-of-Mine law passed February, 1914, and became operative 90 days after passage. This bill provided that every loader and miner of coal in the state, who, under the term of his employment, was to be paid for mining or loading such coal on the basis of the ton or other weight, should be paid for such mining or loading according to the total weight of his output.

This law put into effect a new basis on which wage agreements could be entered into between miners and operators of the state, as all previous wage agreements had been made on the basis of the ton or other weight of the amount of *lump coal* mined. On account of the provisions of this new law, it was a difficult matter for the miners and operators to come to any satisfactory agreement on a price based on *run-of-mine,* as conditions varied in different sections of the coal-producing districts of the state. In consequence, the coal industry of Ohio for the year 1914 was more or less demoralized, due to this changed system of mining. The industrial depression also served to lower the production and, as a consequence, the tonnage will probably show a decrease of 50 per cent.

During July, a number of conferences were held with the object in view of effecting a settlement, and agreeing upon a wage scale which would be satisfactory to both interests. Later on, district meetings were held, which resulted in several of the coal districts signing up agreements and resuming operations.

The Hocking Valley and Jackson County districts resumed operation about Aug. 1, as well as the Guernsey County district; many of the smaller coal areas are also in operation; however, eastern Ohio, which is the largest coal-producing district in the state, is still suspended.

Accidents

For the fiscal year ending Nov. 15, 1914, 76 fatal accidents were reported; from Nov. 16, 1913, to Dec. 31, 1913, 18 fatalities were reported; from Jan. 1, 1914, to Dec. 1, 1914, 59 fatalities were reported.

Causes to Which Accidents Were Attributable

For the fiscal year ending Nov. 15, 1913, to Nov. 15, 1914, the causes to which the fatal accidents were attributable were as follows: Falls of roof caused the death of 53 persons; mine cars, 11; motors, 5; mining machines, 2; premature explosions, 2; explosions of gas, 1; electricity, 1; and miscellaneous, 1.

Measures of Safety

(a) *Safety Commissioner*—On Jan. 1, 1914, the Industrial Commission of Ohio appointed a safety commissioner of mines. This appointment was made with the object in view of reducing the number of fatalities in and around the mines and to devise any measures of safety that might be deemed advisable which would tend to lessen the number of accidents.

"Safety-First Consideration" was the slogan adopted. The first publicity step taken into consideration by the safety commissioner was the issuing of monthly bulletins, giving an account of all the fatal accidents, a synopsis of all the facts and circumstances surrounding the death of each person, and comments made in regard to the manner by which the accidents might have been avoided or prevented.

(b) *Motor and Mule Trips*—Trip agreements regulating motor and mule haulage were also inaugurated. This agreement provided for the regulation of the number of persons permitted to ride at any one time; for the speed at which the trip should be run; for the prohibition of carrying powder, and for the otherwise safe operation of the trip.

(c) *Reporting Conditions of Mines after a Long Suspension*—After a long suspension, such as was experienced during the year owing to the operation of the Run-of-Mine law and other industrial depression, mines are liable to get into very unsafe condition from falls, accumulations of gas, disarrangement of electric wires, the filling up of refuge holes, etc. In consequence, this department issued a circular letter calling attention to these matters and requesting all mines to be thoroughly examined before being placed in operation. Especial attention was called to the examination of all machinery, hoistings, fans, hoisting signals, electric wires, refuge holes; in fact, all mine equipment was to be thoroughly gone over and a report made to the safety commissioner.

(d) *Solid Shooting*—In carrying out the provisions of Amended Section 976—1-2-3, of the mining laws passed Feb. 5, 1914, relative to the method of mining known as "shooting off the solid," this department prepared a list of questions which it was necessary for coal companies to fill out and answer and return, together with a petition to which was to be attached their own signature, as well as the the signatures of a majority of their employees, making request for mining coal by this method.

These questions and answers related to the following: Amount of powder used; size of bit used in drilling the hole; whether dynamite was used or cutting done; whether squibs and fuse were both used, and reasons given as to why it was necessary to mine the coal in this manner.

After these questions were fully answered to the entire satisfaction of the mining department, a permit was issued, with fixed rules to govern this method of mining.

These rules regulated the amount of powder to be used and the spread of the bit. Dynamite was prohibited as

*Chief deputy and safety commissioner of mines, Columbus, Ohio.

well as excessive charges of powder; shots were to be fired in rotation, and in all mines where more than 15 men were employed, all shots were to be fired at quitting time.

(e) *Fireboss Reports*—Realizing the dangers encountered in gaseous mines, this department prepared fireboss blank report books, which were mailed out to all mines known to generate firedamp, and where firebosses were employed. Coal companies were requested to have their firebosses fill out these blanks daily in duplicate form, retaining one report for their office records and mailing the other to the deputy mine inspector, in whose district the mine was located. After these reports have been gone over by the deputy mine inspector, they are mailed to this office to be checked over and any suggestions offered which may be deemed necessary. These blanks provide for reporting where gas was found, in what room or rooms, and the number of the entry; also space was provided to report other dangerous conditions, such as falls, bad top, etc. In this way the deputy inspector and this department are kept in touch with the conditions of mines known to generate firedamp, which are always considered the most dangerous.

(f) *Mine-Rescue Car*—One of the most important factors relating to safety which the state has inaugurated was the purchase and equipment of a mine-rescue car. This car has already performed valuable service in a mine fire during the year, and in the reopening of a mine where a fire has originated and which had been sealed up for several months.

(g) *Oil and Gas Wells*—The law permitting oil and gas wells to be drilled within the limits of coal-producing counties, although safeguarded by law, has caused serious concern on account of some of them being drilled through coal mines in operation, and proper precautions for safety not always being used in all cases.

So serious became the situation that a resolution was recommended by this department and was adopted by the Industrial Commission of Ohio, July 6, 1914, requiring all oil- and gas-well companies to file a map, showing the location of wells to be drilled, 10 days before commencing to drill said well or wells.

Upon receipt of the proposed location, if satisfactory and in compliance with the statutes regulating same, a permit is issued giving authority to drill these wells. This requirement met with opposition and disapproval by many of the oil- and gas-well companies, and the matter was taken up with the Industrial Commission of Ohio. This conference resulted in a committee being appointed, consisting of the representatives of three coal companies, three representatives of oil- and gas-well companies, the state geologist, a representative of the engineering department of the Ohio State University, and the commissioner of safety and chief deputy of mines, division of mines, of the Industrial Commission of Ohio, acting as chairman.

This committee was instructed to investigate the question of oil and gas wells penetrating the coal-producing counties of the state from every angle, and was requested to report to the Industrial Commission of Ohio some plan that would be satisfactory to all persons interested and which would not work a hardship on the oil and gas companies. At the same time "safety" was not to be ignored, and the future operation of coal lands yet undeveloped was to be taken into consideration, and life and property protected.

(h) *Heating Mine Air*—Early in November this department issued a bulletin to operators, general superintendents, mine bosses and mine foremen, relative to dangers arising from cold weather, as the cold air entering the mine is warmed and absorbs moisture; it was also recommended that all dusty places be wet down. It was recommended that the air be heated to at least 40 to 45 deg. The method of carrying out this plan was left to the judgment of the mine managements, owing to local conditions varying in different parts of the state.

(i) *Checking Up the Deputy Inspector's Orders*—During the year this department put into operation a system of checking up all orders issued by the deputy mine inspectors to mine managements. In this way an order is followed up until complied with.

Mining Department Acts as Mediator

(j) *Matters of Arbitration and Conciliation*—During the year the safety commissioner and chief deputy have been called upon by the Industrial Commission of Ohio to act as arbitrators where disputes have arisen between employer and employees, and there has been difficulty in effecting a settlement. Chief of these was the settling of strikes in and around the brick plants and clay mines of the Shawnee and Straitsville districts, which, owing to disputes, had been suspended for about three months.

Operators and miners finally decided to arbitrate and requested the Industrial Commission of Ohio to name an arbitrator. This matter was referred to the mining department and all disputes were adjusted to the entire satisfaction of both employer and employee, and a three-year contract signed which covered in detail all classes of labor in and around the plants and coal mines. Many other local cases of arbitration have been disposed of by the mining department acting as mediator.

(k) *Rules and Regulations Affecting English and Non-English-Speaking Persons Employed in and around the Mines of the State*—Owing to the numerous fatal and nonfatal accidents in the State of Ohio, the greater number being attributable to carelessness and neglect on the part of the mine management and miners, the fact was brought to the attention of the Industrial Commission of Ohio, through the division of mines, that some of the laws of the state were, in many instances, being violated.

The mining department felt that a great many of the violations were due to the fact that mine managements, miners and men employed in general, did not familiarize themselves with the laws under which they labor; therefore, for the purpose of enlightening all nationalities in their own language, it was deemed advisable that excerpts of the mining laws be printed in pamphlet form and a set of rules attached thereto governing the different occupations in and around the mines, with a request that all familiarize themselves with the same in order to carry out the advice given, and as far as it is within the power of all those connected with mining in any way, to assist in seeing that the same is carried out.

The mining laws in condensed form, with rules, have been printed in the English language, and we expect soon to have them finished in the foreign languages, when they will be distributed to each and every person in and around the mines—superintendents, mine bosses, and all vested with authority, as well as miners and mine laborers.

Wolf Run Explosion

This explosion was of a most unusual nature and occurred at the Wolf Run mine, June 14, 1914, due to an explosion of firedamp. The fan, which was located at the top of a two-compartment shaft, and operated as a blower, had been shut down for a period of 16 days; during this time the mine filled with firedamp, the volume becoming so great that on this date it began to drift up the shaft, where a number of men were engaged in making repairs or alterations to the fan.

One of these men carried an open light into the fanhouse, igniting the gas. As the flame followed the column of firedamp down the shaft, the men ran from the fanhouse, escaping from the path of the explosion before its full force was manifested at the surface. Fortunately, all escaped serious injury, but two of them were slightly burned. Flame issued from this shaft in great volume and with considerable violence, igniting a pile of mine posts about 30 ft. from the shaft.

The greatest damage was done in the west part of the mine, a large number of stoppings in both live and abandoned workings were destroyed, and doors, tracks, timbering and wiring were displaced. The force of the explosion was manifested in the innermost workings, mine cars near the head of the workings being badly damaged. There was also some evidence of flame in some of the working places, but probably owing to a deficient supply of air, no fires resulted. The deficiency of air also probably prevented the explosion from being much more violent and destructive.

Following this explosion a number of conferences were held with the management and owners of the mine and plans discussed as to the best method of operating same to avoid similar explosions in the future.

Mine Fires

Superior No. 9 Mine Fire—On Mar. 1, 1914, the Industrial Commission of Ohio purchased a mine-rescue car for use by the department of inspection, division of mines, in mine-rescue work and for use in any emergency met with at mines, such as mine fires, explosions, or other mine catastrophes. This mine-rescue car has been fully equipped with helmets, resuscitating apparatus, and a small hospital fully equipped with first-aid outfits and surgical instruments. Hospital equipment on mine-rescue cars is a new feature and should prove of great benefit in cases of emergency.

Aug. 12 saw the Buckeye mine-rescue car on its initial trip, having received a call that the Superior No. 9 mine, located near Wellston, Jackson County, Ohio, and operated by the Superior Colliery Co., Detroit, Mich., was on fire, the tipple having been destroyed, and the fire extending to the timbers and coal on the bottom on the north side of the mine.

The fire occurred on Aug. 11, and the fire department at Wellston was called upon to assist in extinguishing the fire. The department responded and did excellent work. However, when the fire extended to the bottom, and there was fear that it would be difficult to control, the state rescue car was called and responded, arriving at the mine on the morning of Aug. 12, in charge of J. M. Roan, Chief Deputy and Safety Commissioner, and Assistant Chief Deputy J. C. Davies, who entered the mine at once upon arrival by slope or manway, and succeeded in reaching the fire.

After consultation it was decided to take the hose down the slope and up to the fire; from this position a stream of water was thrown on the flames for three hours, when the fire was under control. A force of men was then set to work to timber the run-a-round and make it safe in case it should be necessary to carry the hose on the south side of the mine.

A number of the deputy mine inspectors assisted in this work. On Aug. 13, it was discovered that the coal was on fire on the southwest side of this shaft, and it was extinguished by water thrown from the north side.

Aug. 14, another examination of this mine was made and no fire found. A. J. Lafferty, superintendent, U. S. Morris, general superintendent, Mr. Samuels, mine foreman for the company, and other employees of the mine rendered valuable service in fighting the fire.

Sunday Creek No. 301 Mine Fire—Aug. 16, 1914, the mine-rescue car was again called to assist the mine management of the Sunday Creek Co., Columbus, Ohio, in reopening their No. 301 mine, located at Congo, Perry County, Ohio. This mine experienced a serious mine fire Nov. 1, 1913, which was supposed to have been caused by electric wires. Several of the deputy mine inspectors were called upon at this time to assist Inspector Thos. S. Grogan, in whose district the mine was located.

The fire was located about 3000 ft. from the entrance to the mine. It was considered useless to try to extinguish the fire, and it was decided to seal it off. This work was attended with considerable danger, an explosion taking place while the work of construction was in progress. Fortunately, no one was injured, the workmen and those overseeing the work not having been in the direct line of the explosion. After further consultation it was agreed to be too dangerous an undertaking to continue the work of sealing off the mine in the locality in which the fire was located, and it was decided to seal the mine from the outside, which was done Nov. 9, 1913.

The mine having been sealed up entirely for a period of ten months, it was decided to reopen it to ascertain if the fire had been entirely extinguished, and the state rescue car arrived at the mine on Aug. 15, 1914, several of the deputy mine inspectors having been called to assist in the work.

August 17, 18 and 19, were spent in making ready to shoot the bottom of the shaft on the first north and third north entries, which was completed Aug. 20, 1914, and the fans placed in operation. An inspection was then made at the bottom of the shaft in the north third entry by Chief Deputy J. M. Roan, and Deputy Inspector L. D. Devore, when it was agreed that the fire territory would be explored that evening and that the helmets would be used for that purpose. At 10 o'clock each inspector, equipped with a helmet, entered the shaft. Inspectors Devore, Wheatley and Grogan were selected to lead the exploring party to where the fire territory was located. Chief Deputy and Safety Commission of Mines J. M. Roan, acted as a signal between the men making the examination and the reserve force of deputy inspectors, which was in the rear to act in case of emergency, if any accident should befall the exploring party.

Upon examination the fire was found to have been extinguished. On Aug. 21, the main shaft was cleaned out and an effort to remove the blackdamp from the mine was then in progress; this will require a great deal of

time, as the mine has a large area, and there will be a number of stoppings to be built.

Inspections

Two thousand three hundred and fifty inspections were made by the 12 deputy mine inspectors, in addition to the inspections, joint conferences and investigations made by the chief and assistant deputies. Three hundred days were spent by the deputy inspectors and assistant chief deputy, in the oil- and gas-well fields looking up delinquent oil- and gas-well companies who were failing to carry out the provisions of the law relating to securing a permit to drill wells for oil and gas penetrating the coal-producing counties of the state; also witnessing the abandonment of oil and gas wells to see that they were plugged and sealed according to law.

Fines and Prosecutions

Fourteen prosecutions were reported to the department during the year; there may have been many more prosecutions brought by coal companies that have not yet come to the attention of this office. Of the number reported, eight were brought by coal companies against their employees, or loiterers, two by the deputy mine inspectors, and one by the safety commissioner of mines.

The most serious violations reported were for removing danger signals, nine in all. It does not seem that any miner or any other employee of a mine would become so careless or negligent of not only his own safety, but the safety of others, that he would remove a danger signal placed there by a fireboss making his examination in the morning before the men enter the mine. Violations for such causes as this cannot be too vigorously prosecuted and the full penalty assessed, no matter who the offending person may be.

One arrest was made for failure to supply props and timber by the mine management; one for a person entering a mine intoxicated; one for loitering around mine property, and one for violating the section relative to the use of motor haulage in mines; one for depositing calcium carbide on the inside of a mine. On Dec. 5, 1914, two men were prosecuted and fined for throwing back fine coal in a mine, contrary to the law.

Mining Legislation

During the year the "Run-of-Mine" law was passed, regulating payment by weight for all coal mined; section 976—1, 2 and 3 of the mining code was amended, regulating the method of mining coal known as "shooting coal off the solid," and providing for a permit to be issued in all such cases based upon questions made out relative to the seam of coal; why it was necessary to so mine the coal; the amount of explosives used, etc.; this petition, requesting permission to shoot coal off the solid, was to be signed by the mine management and a majority of the miners employed at the mine desiring to mine the coal in this manner.

Section 934 of the mining laws was amended relative to mines at which ten or more persons were employed; for every 35 so employed, a waterproof blanket, a sufficient quantity of bandages and other linen and all other requisites were to be provided in case of accident; at mines known to generate firedamp, so as to be detected by a safety lamp, a sufficient quantity of olive and linseed oil is to be kept for use in emergency.

Conclusion

The Industrial Commission of Ohio has jurisdiction over a number of departments of state, of which the division of mines is one, and its powers are sweeping in effect. This commission has authority to enter any place of employment to collect statistics, and to examine provisions made for the health, safety and welfare of the employees therein; to enforce all the laws relating to the several departments under its control. It has power also to promote voluntary arbitration and conciliation between the employer and employed; to conduct free employment agencies; to license persons who desire to act as steam engineers, and operators of steam boilers, and to censor moving-picture films. With such power, which is almost unlimited, great and lasting benefits should result to the state of Ohio.

Don't let your fireman turn his fire upside down so that the ash is lifted to the top. Under those conditions the ash gets hot and melts and by the time it reaches the grates it will form clinker and slag. Boiler fires should be cleaned by the clock rather than by the appearance of the fire.—Bromley in "Power."

Down in Tennessee

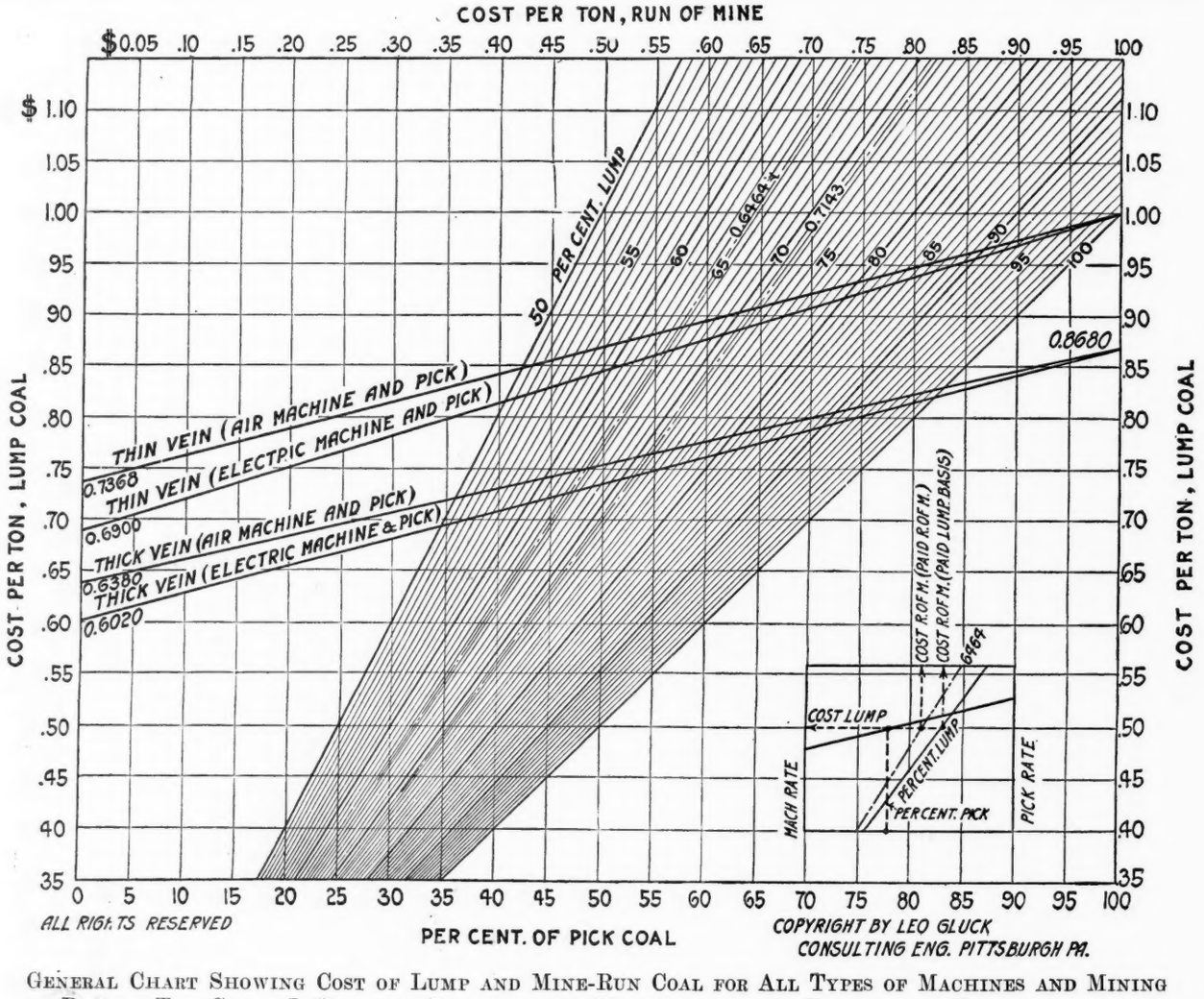
Incline at a Mine of the Chattanooga Iron & Coal Co., Dunlap, Tenn.

The Cost of Mining Coal

The accompanying chart showing the cost of lump and mine-run coal for all types of mining machines and mining rates will be found valuable for quick reference in many instances.

The chart, while primarily designed for the Pittsburgh district, can be used for any other machine or pick rate. If we mark a point on the left side of the chart, equivalent to the lump-machine rate, and then mark another point on the right side of the chart equivalent to the lump pick rate, a line may be drawn connecting the two points, and the chart becomes general.

the "thin vein" is 40 per cent. Then from the line marked 40, at the bottom of the chart, read up to the point where this line intersects the line marked "thin vein—electric machine and pick." We then read to the left and find the cost of lump coal is 81.4c. per ton. Again, from the point of intersection of the "percentage of pick-coal line" (40, with the "electric machine and pick line" read horizontally to intersect the line spoken of above, which shows the base percentage of lump in the mine-run coal. In this case, if this latter percentage is 64.64, we read over to this point of intersection, and then vertically up to the top of the chart, where we can read off the cost per ton of


COST PER TON, RUN OF MINE
$0.05 .10 .15 .20 .25 .30 .35 .40 .45 .50 .55 .60 .65 .70 .75 .80 .85 .90 .95 1.00
$ 1.10 1.05 1.00 .95 .90 .85 .80 .75 .70 .65 .60 .55 .50 .45 40 35
COST PER TON, LUMP COAL
PER CENT. LUMP
50 55 60 65 70 75 80 85 90 95 100
0.6964 0.7143 0.8680
THIN VEIN (AIR MACHINE AND PICK)
0.7368
THIN VEIN (ELECTPIC MACHINE AND PICK)
0.6900
THICK VEIN (AIR MACHINE AND PICK)
0.6380
THICK VEIN (ELECTRIC MACHINE & PICK)
0.6020
COST R.OF M. (PAID R.OF M.)
COST R.OF M. (PAID LUMP BASIS)
6964
COST LUMP
PER CENT. LUMP
PER CENT. PICK
MACH RATE
PICK RATE
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
PER CENT. OF PICK COAL
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General Chart Showing Cost of Lump and Mine-Run Coal for All Types of Machines and Mining Rates. The Chart Is Based on Rates for (1) Undercutting (2) Drilling by Hand, and (3) Loading in Rooms

To make it clear, let us assume the machine lump rate per ton as 69c.; the pick lump rate as $1. Then the line connecting these two points is marked (see diagram) "thin vein—electric machine and pick."

Now the basis for cost of mine-run coal (paid on the mine-run basis) for the Pittsburgh district, is shown by a dot and dash line as 64.64 per cent. lump. Calculations can be made for any other district by substituting another run-of-mine lump base line similar to the 64.64 line shown on the chart.

For example: Suppose the percentage of pick coal in run-of-mine coal paid on the run-of-mine basis—in this case, the cost is about 52.5c. per ton.

For costs of run-of-mine (paid on the lump basis) assuming the run-of-mine to have 70 per cent. lump (30 per cent. screenings), from the point of intersection of the "percentage of pick-coal line" (40), with the "electric machine and pick line," read horizontally to the right to intersect the 70 per cent. lump line, then read vertically up to the top of the chart where we read off the cost per ton of run-of-mine coal (paid on the lump basis), which is for this example about 57c. per ton.

Storage-Battery Locomotives in a Developing Mine

The Nokomis Coal Co. is using a storage-battery locomotive in its new mine at Nokomis, Ill. The results this firm is obtaining are worthy of a passing glance, particularly at this time, when so much is being written relative to the efficiency of this type of haulage.

The storage-battery locomotive seems to be well suited to the needs of the new mine. It can be used in driving the main entry or haulageway until the roadway is extended a thousand or fifteen hundred feet, as no wires need be strung along the headings nor do the rails require bonding. Later on when the mine is developed the locomotive can be placed in a cross-entry or to gather from rooms, and "a no-mule mine" can thus be secured.

This is the system employed at Nokomis, which is one of the most uptodate mines in Illinois and bids fair to be one of the largest mines in the country. The coal is 8 ft. 4 in. thick and the shaft is located in the center of a 3000-acre tract of rich Montgomery County coal. The shaft was sunk in January, 1913, and today the mine is producing 2500 tons daily.

Hauls 1000 Tons and Could Haul More

The cars have roller bearings, weigh two tons apiece and hold five tons of coal. The tracks are laid with 40-lb. rails and the roadways are kept in first-class condition. The six-ton storage-battery locomotive is hauling to the shaft bottom from the northwest main-line haulageway, a distance of 900 ft. with 500 ft. of 1½ per cent. grade against the load. It is also hauling from the southwest entry, also a distance of 900 ft. with a similar 500 ft. of 1½ per cent. grade against the load.

As above stated, the car and load weigh 7 tons and the locomotive is averaging about 200 cars in eight hours, which gives a tonnage of 1000 tons of coal hauled from these two entries by this single unit. This is equivalent to a gross tonnage of 1800 tons as the cars transporting the coal weigh 400 tons and make the trip both ways, once empty and once loaded. The motor has hauled as many as 212 cars in a day of eight hours. The average trip contains five to six cars, but to prove the capacity and ease with which this motor handled the work on the next to the last trip for the day, it was hitched to ten cars, or a combined trainload of 76 tons, including the weight of the motor itself.

Saves Wiring Room Entries and Yet Dispenses with Mules

This machine will soon be placed at the actual work for which it was intended, that of gathering the coal from rooms and delivering the cars to the partings for main-line motors to collect. It will easily gather 200 to 225 cars a day. This demonstrates beyond a shadow of doubt that the storage-battery locomotive will take care of the early output of a new mine and later on it can be placed on room and cross-entry work. Thus it will do away with the mule entirely. It is also a flexible unit and can be taken out of one mine and placed in another with little trouble, wherever, of course, the gage is the same, as it requires no trolley wire or bonded rails.

The results the Nokomis Coal Co. has obtained with this method and the fact that it has now ordered two duplicate motors prove that where these machines are equipped with adequate batteries they will handle a large tonnage economically. This locomotive was manufactured by the Geo. D. Whitcomb Co., of Rochelle, Ill., and was especially designed for the work.

Two Christmas Days in Many Mining Camps

In many of our coal-mining towns, there will be celebrations of two Christmas days, and the same is true of New Year's Day. This is due to the fact that many of the miners are members of the Greek Catholic Church, which has never accepted the Gregorian calendar, by which time is measured by most of the civilized nations. The adherents of the Greek faith, which include Greeks, Russians and the people from the Balkan States, use the old style calendar, which is 13 days later than the one generally used.

A one-day celebration of Christmas is also beyond the conception of the average foreign-born miner, as many require a day or two to get ready, and often the same length of time to recover from the festivities. The Polish miner celebrates the 25th and 26th of December. Thus it is necessary to shut down the mines for at least four days for the first Christmas, and after the Christmas holidays are over the same miners have another holiday on January 1.

Where there are a number of Greek Catholics another period of idleness begins on January 7, and continues for several days, and New Year's day for these people occurs on January 14.

Coal mining presents many queer problems, and one of the queerest is the celebration of dozens of different holidays by the foreigners throughout the year. Often these celebrations, unannounced to the management, will draw away enough workers to seriously hamper the operation of the mines. The difficulty comes from the varying nationalities of the workmen, and each nationality or religious sect has its "holy days" and other occasions for celebration.

There seems to be no remedy for the situation, as an attempt to bring about any uniformity in the observance of these holidays would be like trying to get all the foreign-born miners to speak the same language.

Replacing Valves in Triplex Pumps

A short time ago, says C. H. Lloyd in *Power,* I saw a tool for holding in place the springs on a pump valve where the valve chests open at the side and there is no room to hold the spring down with one hand and start the nut with the other. I always press the spring together and tie it on each side; then it can be dropped in place and the nut put on without difficulty, after which the string is cut to release the spring.

When it is desirable to use compressed air for hoisting, the air can be stored in large receivers. The Anaconda Copper Mining Co. at Butte, Mont., has a number of these 10 ft. in diam., 30 ft. high, having a combined cubical capacity of about 70,000 cu.ft. and capable of retaining about 500,000 cu.ft. of free air, an amount which the compressors combined could not compress in half an hour. The air pressure is maintained constant by a back pressure of water which reduces the capacity of the receivers as the air is used.

The Coal Fields of Ohio

By J. S. Burrows*

SYNOPSIS—A description of the Ohio coal fields containing the best authenticated data there are on the subject. The geology and commercial importance of the different seams are carefully and accurately worked out. This is the second article along this general line, the first having covered the state of Pennsylvania.

The Ohio coal field embraces an area estimated at 12,600 square miles and lies entirely within the eastern half of the state. The field as a whole is a continuation of the Pennsylvania bituminous field to the eastward, and with it forms the northernmost part of the great Appalachian field, which extends southward from Ohio into West Virginia and Kentucky and thence through Tennessee as far as central Alabama.

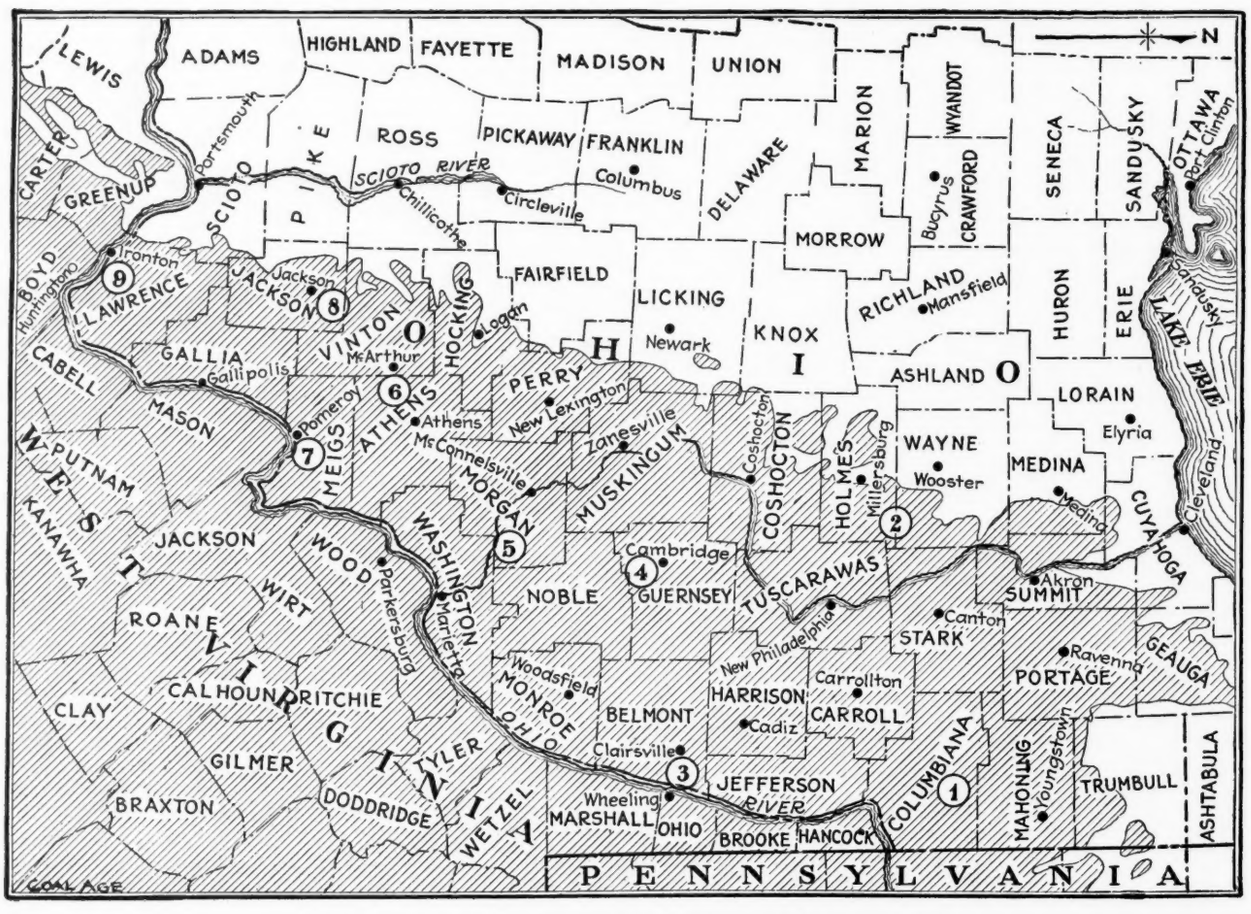
The accompanying map of Ohio shows the coal areas and principal mining districts, the latter indicated by the numbered circles. The numbers refer to the table of mining districts which gives the particulars covering each district. The last column in the table of mining districts refers to the index column of the table of coal beds from which may be found the important coals of each district.

*Fuel expert, Castner, Curran & Bullitt, Inc., Norfolk, Va.

The table of coal beds is arranged geologically from the lowest known coal at the bottom of the table to the highest coal at the top. This table, which has been compiled from the best information available, is based on

MINING DISTRICTS—OHIO

Map No.	Name of District	Railroads	Kind of Coal	Principal Uses of Coal	Index Numbers Important Coal Beds
4	Cambridge	B. & O. R. R., Cleveland & Marietta Ry	Bituminous High Volatile	Steam, Railway and Domestic	4-7
6	Hocking Valley	B. & O. S. W. Ry., K. & M. Ry., Hocking Valley, Zanesville & Western, Cin., Toledo & Ohio R. R.	Bituminous High Volatile	Steam, Railway and Domestic	10-7
9	Ironton	Detroit Sou. R. R. C. H. & D. R. R.	Bituminous High Volatile	Steam, Railway and Domestic	11-14
1	Mahoning Valley	Penn. Lines, Erie R. R.	Bituminous High Volatile	Steam,-Railway and Domestic	7-10
2	Massillon	Penn. Lines, W. & L. E., Cleveland, Akron & Columbus R. R.	Bituminous High Volatile	Steam, Railway and Domestic	10-7
5	Meigs Creek	B. & O. R. R.	Bituminous High Volatile	Steam, Railway and Domestic	2-4
3	Ohio River	Penn. Lines, W. & L. E., Cleve., Akron & Columbus R. R.	Bituminous High Volatile	Steam, Railway and Domestic	4-8
7	Pomeroy	Hocking Valley R.R.	Bituminous High Volatile	Steam, Railway and Domestic	3-4
8	Wellston	C. H. & D. R. R., Hocking Valley, B. & O. S. W. R. R., Detroit Sou. R. R.	Bituminous High Volatile	Steam, Railway and Domestic	18-19



Map Showing Coal Areas and Different Fields in Ohio

The Coals of Ohio

Index No.	System	Series	FORMATIONS	NAMES OF COAL BEDS	NOS. OF COAL BEDS	LOCAL NAMES OF COAL BEDS	COMMERCIAL IMPORTANCE
1	(Upper) Carboniferous	Pennsylvanian	Monongahela	Waynesburg	8-b or 11	Macksburg	No commercial importance.
2				Sewickley	8-a or 10	Meigs Creek	Comparatively unimportant, coal with future value.
3				Redstone	9	Pomeroy	Mined in Gallia, Lawrence and Meigs Counties.
4				Pittsburg	8	Pittsburgh number eight	Third place in production. Will probably take first place in future. Occurs in sout easter part of the state and occupies the whole or a part of Belmont, Jefferson and Meigs counties, the most important productive areas, and Harrison, Guernsey and Athens counties.
5			Conemaugh	Crinoidal	7-b	Norwich and Patriot	Commercially unimportant.
6				Mahoning	7-a	Grof, Strip vein, and Brush Creek	Commercially unimportant.
7			Allegheny	Upper Freeport	7	No. 6 in Southern Columbiana County, No .7 in Stark County, and Southwestward, Black band coal in Stark and Tuscarawas counties, Big Vein of Salineville, Del Ray and Sherrodsville coal, Cambridge coal, Alexander coal of Muskingum County, Blue Rock coal of the Muskingum Valley, Bayley's Run and Norris coal of the Hocking Valley, Waterloo coal of Gallia County.	Second place in production, and extensively mined in Guernsey and Carroll counties and an important coal of the Sunday Creek district.
8				Lower Freeport	6-b	No. 5, No. 6-a in Stark County and Southwestward Whan coal of New Lisbon, Steubenville Shaft coal, Hamden Furnace coal of Vinton County, Hatcher coal of Lawrence County.	Thin and uncertain except in the Steubenville district along the Ohio River where it is mined to some extent.
9				Upper Kittanning	6-a	No local name	Absent or of no value.
10				Middle Kittanning	6	No. 4, Osnaburg coal of Stark County, Pike run and Dennison coal of Tuscarawas County Coshocton coal, Upper Zanesville coal, Upper New Lexington coal, Nelsonville and Straitsville coal, Great Vein of the Hocking Valley, Carbondale and Mineral City coal, Upper Zaleskie coal, Washington Furnace coal, and, Sheridan coal.	First place in production and extensively mined in Hocking, Perry, Tuscarawas, Athens, Coshocton, Carroll and Muskingum Counties. The coal known to the trade as "Hocking Valley coal" is taken from this bed.
11				Lower Kittanning	5	No. 3, No. 4, Leetonia, Creek Vein, Hammondsville, Potter's Vein, Clay Vein, Mineral Point coal, Lower New Lexington coal, and New Castle coal of Lawrence County.	Thin but persistent bed found in nearly every county in the coal fields of the state and the source of a considerable output in Tuscarawas County where it reaches its greatest thickness.
12				Upper Clarion		Limestone coal of Jackson and Vinton counties, No. 4 of Mahoning County, No. IV-a.	Commercially unimportant.
13				Lower Clarion		Limestone of Jackson and Vinton counties, No. 4 of Mahoning County, No. IV-a.	Commercially unimportant.
14				Brookville	4	Gray Limestone coal, Upper Limestone coal, Winter's coal of Vinton County, Flint Run coal, Conway coal of Lawrence County, No. 3-c.	Generally unimportant, coal mined to some extent in Vinton County.
15			Pottsville	Tionesta	3-b	Wartman coal, Bolivar coal of Stark and Tuscarawas counties.	Commercially unimportant.
16				Upper Mercer	3-a	No. 4, No. 3, Bruce coal of Mahoning County, Strawbridge cannel of Holmes County, Bedford cannel of Coshocton County, Newland coal of Vinson County.	Commercially unimportant, coal bed changing at some points into low grade cannel.
17				Lower Mercer	3	No. 2 of Mahoning County, Blue Limestone coal, Flint Ridge cannel.	Generally of little commercial value, but mined to some extent in Carroll and Mahoning counties.
18				Quakertown	2	Wellston coal, Jackson Hill coal.	Generally thin commercially unimportant coal bed, but most important coal of Jackson County where it has been extensively mined although the production of this area is gradually declining.
19				Sharon	1	Palmyra, Block coal of Mahoning Valley, Briar Hill coal, Massillon coal, Wadsworth coal, Jackson Shaft coal.	Formerly extensively mined beginning in 1828 but now nearly exhausted. Principal operations at present in Stark County.

the Pennsylvania nomenclature. As stated in the first paper of this series, covering Pennsylvania coals,* the official names of formations and coal beds adopted for the State of Pennsylvania, are considered the standards of reference for the coals of the Appalachian fields.

Originally the Ohio coals were designated numerically from No. 1, which is now correlated with the Sharon coal, consecutively up to No. 8, which is the Pittsburgh seam, there being considered but eight coal beds in all. Later discoveries, however, made it necessary to increase the series. This was accomplished by adding more numbers to coals higher than the Pittsburgh and by using a letter with the old numbers where the addition of an intermediate seam came within the old series of numbers. This system has caused some confusion in identifying the Ohio coals, which is greatly increased through the use of a large number of local names for the same bed, both within the same, and in different districts.

In the table of coal beds presented herewith, the correct, or Pennsylvania names, for the coal beds are given precedence, followed by the old Ohio system of numbers and then the numerous local names.

The coals of Ohio are entirely bituminous in character, that is, of the high-volatile type, and while they are mostly used for steaming, railway and domestic purposes, several of the seams yield coal suitable for special purposes, such as rolling-mill and blast-furnace work. Other seams yield coal which is widely known as a high-grade domestic fuel.

* "Geology and Location of the Coal Fields of Pennsylvania," Coal Age, Vol. 6, p. 459.

One soldier out of every four men—that is the measure of the response given by the miners of Northumberland and Durham to the call to arms. Over 40,000 of the 170,000 organized colliers in the two counties are in camp. The miner, as a rule, makes an excellent fighting man. He is not of imposing stature, but he is tough and fearless. The pit has no place for the weak or timid.—"New York Evening Post."

Durable and Fireproof Linings for Mine Shafts

Much has been written of late concerning the construction of durable and fireproof mine shafts. A further contribution to the existing literature upon this subject may not, however, be without value.

The problem involved divides itself into two phases, first the lining of a new shaft and second the protection of a shaft lining already in place and in use, so as to render it both durable and fireproof.

When a new shaft is to be sunk, the engineer may consider the nature of the strata to be penetrated, and then select from several excellent designs which have been tested in actual use the one which circumstances and financial limitations may prove to be the most satisfactory, all things considered.

Excellent designs of concrete linings for shafts were described in COAL AGE for Nov. 7, 1914, and in *Colliery Engineer* for August, 1913.

The Allen & Garcia Co. of Chicago is at present engaged in lining a new shaft at Sesser, Ill., with premolded beams and slabs. The latter being cast complete at a factory in Indiana and shipped to the mine, to be lowered and secured in place in a manner quite similar to that employed in timbering. A description of a somewhat similar installation may be found in the *Engineering Record* of Oct. 31, 1914.

It is the purpose of this paper to describe a method of lining a shaft which may be applied to a new operation or adopted for the protection of one that may have been timbered and which it is desired to protect against fire, decay or corrosion.

"Gunite" is a trade name to denote the grout deposited by means of the cement gun. The mixture usually employed is composed of one part portland cement to three parts of sand. When this is "shot" by an air pressure of about 25 lb. per sq.in. by means of the cement gun, the product adheres tenaciously to the surface of application, regardless of whether this surface is masonry, wood or steel. It is quite dense, being about 23 per cent. heavier than 1:2:4 concrete, while tests have shown it to be impervious to water, nonabsorbent, and possessing a much higher tensile and compressive strength than ordinary high-grade concrete. A 2-in. layer of gunite is considered a safe fire and rust protection for steelwork in skyscraper construction, when subjected to a temperature of 1700 deg. F. for four hours. A 1½-in. layer will protect steel buntons or mine sets against corrosion indefinitely, or it will protect wood or steel from any mine fire which may occur.

A Common Practice

A practice not infrequently followed in coal mining is to line the shaft with solid concrete down to the rock, from which point onward an ordinary thin lining of wood is employed. On the other hand, the same shaft might be lined with wood throughout its entire depth, the sizes of the timber depending upon the depth of the shaft and the pressure encountered. A 2-in. layer of reinforced gunite would fully protect this wood from fire and seal off all water and air, making a shaft at once dry and fireproof. The water-logged timber behind the gunite lining would never be subjected to the action of the air and would consequently never decay or require repair.

In the case of a new shaft with new timbers, the gunite protection insures durability as well as fireproofness. Since decay in wood requires the presence of moisture, warmth and air, the exclusion of the latter renders these timbers proof against deterioration. There is the further advantage that sinking may be pursued in the usual manner, and the gunite applied on the night shift after the shaft is completed and while it is in operation during the day. This grout lining is also an extremely efficient means of sealing off the airway in the shaft from the hoisting and manway compartments. In an old shaft, on the other hand, if decay has not already made damaging progress, the shaft may be fireproofed and secured against further deterioration by this method.

There are many instances, also, where a timber lining may be omitted entirely through the rock strata. This is accomplished by sinking and trimming close to the required dimensions and then sealing up the interstices of the rock with gunite applied before the mineral has had opportunity to disintegrate. In this case the grout is shot into every crack and crevice, not only covering the surface, but cementing adjacent strata together.

In some mines it is necessary to use heavy sets either of wood or steel, with lagging on the outside. In this case, the entire inner surface may be protected by reinforced gunite. This method was employed in lining the Cary shaft of the Odanah Iron Co., at Hurley, Wis., a description of which may be found in *Black Diamond* of Oct. 31, 1914. In this case the three-compartment shaft was lined with 3-in. wood plank, carried by I-beam sets. Lagging and beams were then covered with 2 in. of reinforced gunite. The shaft was originally so wet that the sinkers were obliged to work in oilskins. The portion which was lined as above described is now, however, perfectly dry.

The extent to which the various methods of shaft lining are to be employed will depend largely upon the cost of the material necessary. The method of sinking and lining with timbers, as heretofore followed, will doubtless be continued largely in the future, and in general it is believed that when permanency is considered, the method of timber lining and protecting this lining with gunite will be found least expensive. The great advantage claimed for this process is that it can be applied at a relatively small cost to shafts either old or new without seriously interfering with the operation of the mine.

Coal Mining in the Transvaal

By H. F. Mariotte*

The following are the coal outputs and prices per ton in the Transvaal, Union of South Africa, since 1910:

COAL OUTPUT OF TRANSVAAL

	Tons Sold	Gross Receipts — Totals		per Ton	
1910	3,970,000	£986,200	$4,802,794	5.0s.	$1.21
1911	4,344,000	1,021,000	4,972,270	4.7	1.11
1912	4,752,000	1,045,000	5,089,150	4.4	1.05
1913	5,225,000	1,143,000	5,566,410	4.3	1.03
1914 (estimated)	5,266,885	1,180,526	5,749,162	4.5	1.07

The output and value of the coal produced again increased in 1914. There are coal-bearing areas in the province still untouched, and it is not unlikely that, owing to the increased demand for coal caused by the war, efforts will soon be made to develop these resources.

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The Labor Situation

SYNOPSIS—A conciliation committee is appointed to restore industrial peace in the Ohio coal fields now on strike. The operators move to run "open shop" mines. In Colorado, the U. S. troops being removed, the militia has to be called in to replace them, though, so far, this service is local. The union in Illinois obstinately demands a favorable decision while admitting that it is in the wrong.

The statement of President Dwight P. Cary, of the Lorain Coal & Dock Co., most adequately describes the strike situation in the eastern Ohio field:

During the ten months in which the miners have been on strike in eastern Ohio, they have been treated by the operators with every fair and reasonable consideration. They have been permitted to occupy their houses without molestation, and no attempt has been made to operate the mines, either with former employees or nonunion labor. There has been no war against the miner's union. At all times since the so called mine-run law became effective in Ohio, the eastern Ohio operators have been willing and have offered to negotiate a contract on the mine-run basis. The only matter in question has been the price and any statement made to the contrary is absolutely false and misleading to the miners and the public.

All contracts in Ohio, Indiana and Illinois and in the Pittsburgh district of Pennsylvania, the area comprising the central competitive field, have been made under the conditions formulated in the report of the miners' policy committee, which provided that all contracts should be made at the price prevailing in the last agreement or its equivalent. The miners' organization has signed contracts with the operators of Illinois and Indiana and of the Pittsburgh district of Pennsylvania providing the same wage scale as prevailed in the preceding agreement.

It also made a contract with the operators of the Hocking Valley district of Ohio in which the scale is approximately 3c. per ton less than the scale prevailing under the last agreement. Nevertheless it has demanded that the operators of eastern Ohio pay an increase of approximately five per cent. above the price prevailing in the last contract.

The strike of the last ten months has given our business to the operators of other states and districts, and an increase in our price would enable them to retain it. This is the reason why we have opposed the increase. Just why the miners' organization should hold their eastern Ohio miners on strike for ten months, demanding a scale that is a decided increase over our last contract price, and over that given to competing operators, thus playing directly into the hands of our competitors, is something that we fail to understand.

The Pursglove-Maher Coal Co. states that its eviction order which was effective Jan. 15 has been held up pending the result of the federal investigation of the strike situation. This statement was made after it was definitely decided that the U. S. Department of Labor would take a hand in the settlement.

A Conciliation Committee Appointed.

To this end the Department on Jan. 5 appointed Hywell Davies, one of its representatives, one of the two unsuccessful conciliators in the Colorado dispute, and Daniel J. Keefe, formerly Commissioner-General of Immigration, Dec. 1, 1908 to May 31, 1913. In 1882 the latter was president of the Lumber Unloaders' Association and since 1893, except during an interval of two years, has been president of the International Longshoremen, Marine & Transport Workers' Association. He was an original member of the National Civic Federation and was at one time sixth vice-president of the American Federation of Labor and was a member of the Industrial Peace Commission in 1906.

On Thursday, Jan. 7, Hywell Davies arrived in Cleveland, Ohio, and conferred with President W. R. Woodford of the Pittsburgh Vein Operators' Association. On the same day Daniel J. Keefe discussed the situation with President T. P. White, Vice-President Frank J. Hayes and Secretary-Treasurer William Green, of the United Mine Workers of America. This meeting occurred at Indianapolis, Ind. On the following day the conciliators met at Cincinnati, Ohio.

Desire Conciliation if Conciliators will Concede Claims

A meeting of conciliators, operators and miners was arranged for last Wednesday, Jan. 13, but we have no advices as to its outcome. Thomas Haggerty, C. J. Albasin and Thomas Cairns have all declared themselves as not unfavorable to the investigation. C. J. Albasin, the local president, however, in writing to W. B. Francis, of the House of Representatives at Washington, while thanking him for his action toward the appointment of conciliators, declares his firm intention not to be conciliated unless his demands are granted in full. T. K. Maher, of the Pursglove-Maher Coal Co., said the operators welcomed the federal investigation and had no fear of the result.

"Open Shop" Operation to Be Attempted

On Jan. 7 the eastern Ohio operators, after a three-day conference, announced that they would open their mines on the "open shop" basis. The operators voted unanimously for that policy and it is expected that efforts will be made to start the mines in Belmont, Harrison and Jefferson Counties. At several mines instructions were given that the miners were to be informed of the intention to start the mines and that those desiring work must apply individually. Preference is to be given the old employees in every case. Failure to obtain a sufficient number of union men will result in the bringing in of other men from outside of the district.

A special committee, comprising W. R. Woodford, Michael Gallagher, H. E. Willard, Joseph Pursglove, S. H. Robbins, of Cleveland, George M. Jones, of Toledo, and Judge R. L. Wildermuth, of Columbus, was appointed to direct the reopening of the mines and to remain in Wheeling, W. Va., to watch developments until they were again working. Only one mine will be opened by each company at this time.

It was reported on Saturday that the Somers-Roby Coal Co. had 50 men at work in a mine in Belmont County and on Monday had 60. This is one of the properties opened under the open-shop system.

Moving Out of Ohio

It is said that the Lorain Coal & Dock Co. will close all their Ohio mines except the Crescent and will supply their trade from a new mine in Logan County, W. Va., the work of erecting the tipple progressing rapidly. Samuel and James Pursglove, large stockholders in the Pursglove-Maher Coal Co., are preparing to let contracts for a new tipple in Logan County, W. Va. The Troll Mining Co., of St. Clairsville, Ohio, purposes to close its mines indefinitely. No matter what the outcome of the strike may be, operating in Ohio will not be attractive and the first two companies will probably endeavor to get all their coal in West Virginia.

Miners in Illinois Declare Themselves Not Guilty But Will Pay the Bill

A serious break between the United Mine Workers and the Illinois Operators' Association threatens as the result of a dispute over the wages at the mine of the Berry Coal Co. at Spring Valley. The miners have been on strike for several weeks, and the operators insisted that the strike be called off.

The United Mine Workers' officials contend that their miners are in the right, but have agreed to reimburse the coal company the amount of money in dispute if it will acknowledge the claim. As a matter of principle, the operators will not concede this, and have served notice that they will have no further dealings with the miners' organization until the Berry strike is settled. The U. M. W. of A. are trying, according to rumor, to have the Central Illinois Coal Operators' Association and the 5th and 9th District Association agree not to support the Illinois Operators' Association, thus bringing about a disagreement that is likely to cause much confusion and trouble in the Illinois field.

Union Desires to Buy Mines

The United Mine Workers of America has offered $200,000 for the holdings of the Bache-Denman Coal Co. in the Hartford Valley, Arkansas. The transfer is to be conditioned on the quashing of all actions growing out of the troubles between the coal company and the miners, including a suit for $1,450,000 brought by the company to recover for the burning of their tipples and houses.

Militia Called Out In Colorado

The U. S. troops being entirely withdrawn from Colorado, on Jan. 9, Sheriff Jeff Farr, of Walsenburg, concluded he could not protect the jail at that place in which 15 strikers were incarcerated charged with murder, conspiracy, and other crimes, in the mine battles of last spring. Samuel DeJohn, one of the alleged participants in the La Veta ambuscade, is reported to have turned state's evidence, and as he is imprisoned in the same jail, there might have been not only a jail delivery but a lynching. He is the only man who took part in the La Veta attack who has not been taken to Pueblo. A company of 70 militiamen was furnished by Governor Ammons, and two more are ready to assist in case of an emergency.

Editorials

Coal Beds and Their Characteristics

Recent correspondence and even some technical reading have convinced us that the public and some mining men have a hazy idea of the relative unimportance of determining the particular bed from which a coal supply is derived. Of course, it is well known that in *any particular locality,* one bed is clean, another not so clean and perhaps a third is relatively dirty and a fourth may not be workable. Then, also, of course, thickness varies most markedly.

Nevertheless it is also true that as far as freedom from bone, slate and sulphur is concerned, any one bed of coal will vary immensely over large areas. In the bituminous regions of Pennsylvania, for instance, the best coal in eastern Clearfield was the Moshannon or Lower Freeport, in Indiana it is the Miller or Lower Kittanning, in parts of Cambria, the Upper Kittanning. In many places where the Miller is good, the Lower Freeport is worthless, and where the latter is good, the Miller bed can be placed on the market only with difficulty.

We know that a host of people will immediately, on reading this, defend the Miller bed as being everywhere a low-volatile coal of great calorific power. As a matter of fact, where that bed does not have the qualities mentioned, it is not called the Miller bed, but the Lower Kittanning. The low volatility is not a quality of the bed but an attribute of location which it shares with all the other beds in the same locality.

The Miller bed today is being sold as Moshannon coal in Clearfield County, Pennsylvania, because the Lower Freeport, which rightly bears the name "Moshannon," has been almost entirely worked out. The purchaser is really not deceived. He desires a low-volatile coal and he gets it, even though the fuel may come from the Clarion or the Lower Kittanning seam. If he should secure the real Moshannon he will probably find it a badly weathered coal, as most of it now comes from formerly abandoned outcroppings.

To show how largely volatile content varies in the same bed, we will quote these analyses from the report of the U. S. Bureau of Mines, the United States and Maryland Geological Surveys and the Second Geological Survey of Pennsylvania.

TABLE CONTRASTING IDENTICAL BEDS IN PARTS OF PENNSYLVANIA

	Moisture	Volatile Matter	Fixed Carbon	Ash
Lower Kittanning—				
Windber mine, Somerset Co.	3.2	12.5	80.6	3.7
Pulaski Township, Beaver Co.	2.2	40.9	49.5	7.4
Upper Kittanning—				
Windber, Somerset Co.	3.0	12.0	77.4	7.6
New Salem, Armstrong Co.	1.2	37.9	52.8	8.1
Lower Freeport—				
Stony Creek, Cambria Co.	4.7	13.8	72.3	9.2
Center Hill, Armstrong Co.	1.0	40.2	47.4	11.4
Upper Freeport—				
Conemaugh, Cambria Co.	2.6	14.9	72.4	10.1
Shippingport, Beaver Co.	1.5	41.4	49.8	7.3
Pittsburgh—				
Eckhart, Allegany Co., Md.	0.7	17.6	75.9	5.8
Bruceton, Allegheny Co.	2.9	36.2	55.1	5.8

It will be seen that the range of values for volatile content is not quite as great in the Upper Kittanning and Pittsburgh beds as in the others. That difference solely arises from the fact that we have taken Armstrong and Allegheny County values in those instances and the coals in those counties are not nearly so high in volatile matter as those in Beaver. As the percentages of volatile matter are about equal in any given boring, it is likely that if we had analyses of Upper Kittanning or Pittsburgh coal near Shippingport, Beaver County, we would find those fuels would have over 40 per cent. of volatile matter, and if we could find Upper Freeport coal at Windber and obtain an analysis, it would probably not be far from 12.0, which is the value for the Upper Kittanning at that point.

It will be noted that one analysis is from Maryland. It is so taken because the figures for volatile matter in that state rule low. Pittsburgh coal is nowhere found in Pennsylvania so near the great uplift, but even in the Salisbury basin of that state that bed is found to contain only 19.61 per cent. of volatile matter, which is much less than the 36.2 at Bruceton.

It is well to add that the excellent analyses in the books published by the Bureau of Mines under the title "Analyses of Coals," as Bulletins 22 and 85, especially the latter, are not by any means complete. It is only just to add that the authors of the bulletins make no claims for completeness except to say they completely cover the tests of the Bureau between July 1, 1904, and June 30, 1913.

Thus in Pennsylvania only 19 counties are partly covered, whereas in all 37 are coal producers. In the State of Ohio the analyses of the coal in only 10 counties are given, whereas 28 counties are reported as coal-producing in E. W. Parker's report. Erroneous ideas can easily be formed by assuming the lists given to be representative of American coals rather than typical of fuels offered to the United States Government for test or purchase.

To state the purport of this editorial in another way: Fuels from different beds in the same districts of Pennsylvania more closely resemble each other than coals from one and the same bed in different parts of the state. Superincumbent and subjacent coals are usually much alike in texture, coking qualities and volatility, whereas coals of the same bed in different counties may not even serve the same industrial purposes, so utterly unlike are they.

The Year of the Great War

We do not know which year will best fit the title of this article. Perhaps there may be several years of the Great War before the struggle is completed, but let us never lose heart. When we compare the cost of the strife with the stock of gold and the holdings of corporations, we are horrified by the immensity of the expenditures, but nations are bigger than their hoardings and stronger financially than their joint-stock companies, and the inefficiencies and wastes of the people are so great that, if these are only surrendered, the champion waste of all wastes, war, can be allowed to continue for years without exhaustion.

Let us be careful of the excessive use of superlatives. It is true the war may be Armageddon, but it does not spell annihilation. Let it not be forgotten that the annual governmental expenditures of the Allies, omitting those of Japan and Portugal from the list, as these countries are really not in the war, amount to the colossal sum of $5,093,006,000. Similarly the annual government outgo of Germany, Austria-Hungary and Turkey amounts to no less than $3,704,527,000. It is easy to see, therefore, that the nations involved have so far not borrowed much more money than would run the governments for a year in peace.

It is interesting to note that the world's governments spend in the piping times of peace $12,626,938,000. These figures obtained from the *World Almanac* show that a large draft on resources can be made, and the world's pockets will meet the strain without disaster.

The wealth of the world is largely of comparatively recent growth. Yet the property of the principals on the side of the Allies foots 184 billions. On the other hand, that of Germany and Austria-Hungary alone is 105 billions. All this takes no count of colonies and minor contestants as Turkey, Servia and Montenegro. If their property is proportional to their annual expenditures, the Allies must have a wealth of 243 billion, and the Teutonic league, resources of 110 billion dollars.

If America would try and forget the struggle, which is not the only source of her misfortunes, and would steadily have faith in herself and a little more consideration for her capitalists, she would experience unfettered prosperity.

Her financial isolation, though so generally deplored, has placed her where the surges of foreign tides can do her no harm.

The Illegitimate Dealer

Out in Indianapolis, a large furniture installment house, for the second time, has entered into the retail coal trade for the winter season. Such cases are not new to the coal business, instances of this kind being on record in many parts of the country. They are none the less a source of irritation, and frequently create bitterness on the part of the strictly legitimate dealers. However, efforts of this kind have seldom ever attained to serious proportions, for it is obviously illogical that a business venture of this character, dependent for success upon the destruction of another business, can long prevail.

So far the scheme has not extended to large proportions, and it is understood that the quality of the coal handled is in keeping with the prices at which it is offered. Under ordinary conditions the dealers' organization would, of course, take immediate steps to compel the operator furnishing coal for such an enterprise to withdraw from the business. But the company supplying this coal seems to have no regular dealer trade.

A Brighter Outlook in the Middle West

Indiana and Illinois coal producers are devoting considerable time and thought to the uniform sizing of coals, and are getting closer together than ever before on the matter of prices and the question of regulating production. While these remedies are not a panacea for all ills, their majority adoption will have a far-reaching effect toward betterment of the coal trade in the Central West. The agitation for concerted effort in these directions is causing many to feel that better conditions will prevail next season, which tends to make the mine operator feel more hopeful.

Producers generally feel that higher prices will be received in the early months of this year than in previous years, and express confidence that benefits will accrue from the movements now afoot to afford the coal man an opportunity to receive his share of the rising prices generally connected with the cost of living. The mine owners of the Central West probably receive a smaller return on their investment than any other kind of industry, and this unfavorable condition will be largely overcome by price agreements, restricted production and uniform methods of preparing coal.

Who Gets the Promotion?

It has been impossible to handle all the replies to the Cartoon Problem, "Who Gets the Promotion?" in time for this week's issue of COAL AGE. An earnest effort was made to get the matter in final shape, but the task was too great for the time available. Several days have been required simply to read and classify the answers, for no question ever advanced by COAL AGE has attracted such widespread interest and elicited so many replies.

Out of the great number of answers sent to us, 102 have been selected by the judges as worthy of consideration. It would require a special edition of our paper to print even this number; so it has been decided to abstract and condense the majority of the answers, only publishing in full the replies selected by the judges as having the greatest merit.

One thing has been shown clearly by the answers received—no single one of the three men up for promotion has all the worth-while arguments or sympathy on his side. High coal-mining officials with thousands of men under them differ wholly in their opinions and choice. Everybody admits the value of a pleasing personality, as indicated by one of the applicants who is popular with his associates. Everyone also condemns being grouchy, although one of the most important mine presidents in the country selects the "grouch" for advancement because of his otherwise excellent qualities.

It is seldom that a question comes so close home to everyone generally as the problem advanced in the cartoon we published. We are all hoping for promotion, and we all realize that certain of our personal traits will be weighed by the boss when he makes his selection of a man for advancement. Consequently, it is likely that COAL AGE readers will be afforded an opportunity to reflect on the matter of their own personal assets, in the way of individual characteristics, when the letters on the "promotion problem" are published next week. It is just possible that some of the answers may help us understand why the other fellow was promoted and we were not.

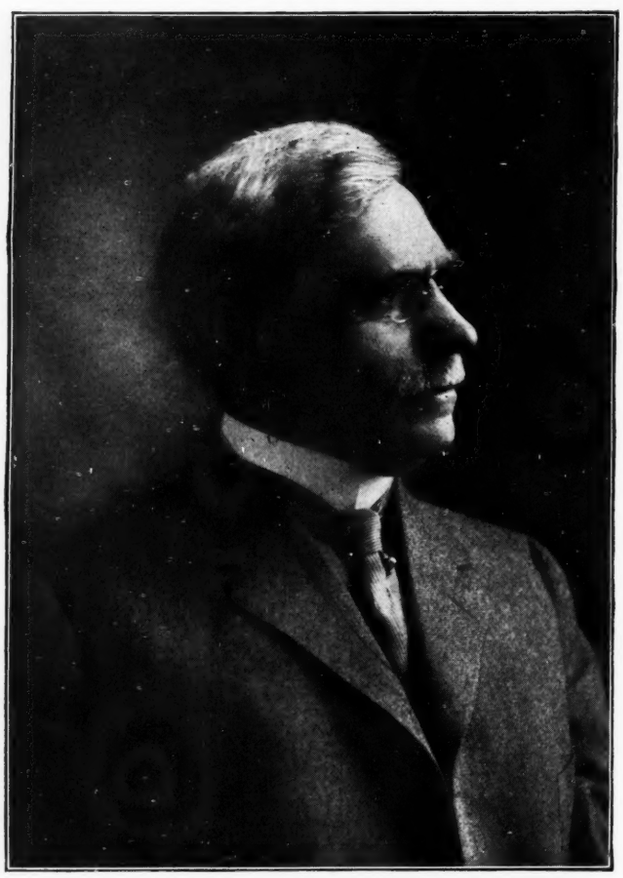
Coal Age Indexes Now Ready

Indexes to COAL AGE are furnished free to all who ask for them. The index for the last half of 1914 can now be obtained by addressing a request for one to the Subscription Department, COAL AGE, New York City.

Thomas Lynch

On Jan. 1, from the Church of the Most Holy Sacrament, in Greensburg, Penn., occurred the funeral of Thomas Lynch, for many years president of the H. C. Frick Coke Co., as well as many other industrial firms. Death occurred from exhaustion following an operation for septic peritonitis.

Of all men who have ever materially influenced the coal-producing and coke-making industry of the land, few, if any, have possessed greater power and at the same time have been more self-effacing. Born of Irish parentage in Uniontown, on Aug. 13, 1854, Mr. Lynch attended the common schools until he was 17 years of age. He then



Thomas Lynch

started his business career as a clerk in a store. In 1875 he began clerking in the Frick company's store at Broad Ford. In 1877, the H. C. Frick Coke Co., then owning 200 coke ovens and about 150 acres of coal, began to expand beyond the confines of the Morgan Valley, leasing what was then known as the Valley Works from Willson, Boyle & Playford. Mr. Frick selected the ambitious clerk in his Broad Ford store to take charge of the new operation, making Thomas Lynch superintendent and store manager. He was also given charge of the Anchor and Ferguson Works, at Dunbar, in 1878, when these were acquired by the H. C. Frick Coke Co.

In 1882, Mr. Lynch was named general superintendent of the H. C. Frick Coke Co., becoming at that time the virtual operating head of the firm. From this time on the Frick company began its phenomenal growth. With H. C. Frick as the executive head of the corporation, and Thomas Lynch as his assistant and chief of the operating department, the company soon dominated the coke trade, which position it has never lost.

In 1890, Mr. Lynch was given the title of general manager, retaining the same until about 1896, in which year H. C. Frick retired as president, Thomas Lynch being elected to succeed him. It was during this period that Mr. Lynch issued his famous Safety-First order.

As president of the firm, Mr. Lynch was by no means a figurehead; he maintained the same close touch with operating conditions which marked his career as general superintendent and general manager, and was admittedly the controlling spirit of the H. C. Frick Coke Co. At the time of his death he was not only president of that company, but was at the head of the coal-mining operations of the United States Steel Corporation. He was president of the United States Coal & Coke Co., of West Virginia; the Bunsen Coal Co., of Illinois; the National Mining Co.; the Sharon Coal & Limestone Co., the Republic Coke Co., and the Hostetter-Connellsville Coke Co., all of Pennsylvania.

On Dec. 16, 1879, Mr. Lynch was married to Miss Sarah Agnes McKenna, of Pittsburgh. At that time he made his home at Dunbar, moving to Greensburg about 1890. He is survived by a widow and the following children: Mrs. Joseph B. Wentling, Miss Sarah A. Lynch, Thomas Lynch, Jr., Ralph Lynch, Clay F. Lynch, and Charles McKenna Lynch, all of whom reside in Greensburg, except Clay Lynch, who is general manager of the Bunsen Coal Co., at Danville, Ill.

Throughout his entire career, Mr. Lynch has been the friend of the workingman and the ardent advocate of safety. In the welfare work among miners, in which the H. C. Frick Coke Co. has admittedly taken the lead, he was strongly interested. He was a firm believer that attractive homes made contented workers and not only encouraged annual garden contests, but strongly supported large appropriations for sanitary improvements in and about the various mining plants under his charge and for safety appliances at the mines and instruction among the employees.

Largest Class of First-Aid Workers

The largest class of mine-rescue and first-aid workers yet trained in the West Virginia coal fields has just completed a successful course at Gary, in McDowell County, and 86 miners have been thoroughly trained for the work at that place by the crew of the United States Mine Rescue car No. 8, which has been in the Pocahontas field for the past two months. In addition to this number, six young men from the Gary High School were also given complete first-aid training.

The hearty and efficient coöperation of the officials of the U. S. Coal & Coke Co., at Gary, made possible the organization of such an unusually large class in this important work, and the enthusiasm manifested by every employee of the company indicates that the efforts of the U. S. Bureau of Mines in this training work will be of a permanent nature.

A large number of classes in the Pocahontas field have been trained by the crew of this car, and at each place enthusiasm and interest have been displayed by both mine officials and employees.

Legal Department

Aspects of F. O. B. Sales Contracts

By A. L. H. Street*

One of the latest and leading court decisions affecting agreements for sale of coal, f.o.b. the seller's mines, is that announced by the Texas Court of Civic Appeals, in the case of Richard Cocke & Co. vs. Big Muddy Coal & Iron Co., 155 Southwestern Reporter, 1019.

The opinion, recognizing the well established principle that delivery of coal to a railroad company at a mine under a contract of sale, f.o.b. mines, constitutes a delivery to the buyer, holds that in a suit by the seller under such a contract, to recover the purchase price, the buyer is not entitled to show that he did not receive any of the coal shipped. The court says: "The proffered testimony of Cocke that he did not get a lump of coal in Houston shipped by the Big Muddy Coal & Iron Co. was properly excluded, because the question was, did the coal company deliver on board the cars at the mine and the fact that only so much coal reached Houston would not tend to prove that it was not put on the cars."

According to the Texas decision, the best evidence of the quantity of coal delivered to the buyer was the record of the mine weights.

The Buyer May Reject a Coal Shipment if the Quality Is Not as Specified in Contract

Again, the Court of Civic Appeals holds that when a buyer of coal inspects that tendered for delivery and finds that it is not what the contract calls for as to quality, he is at liberty to refuse to receive it, and is entitled to sue for such damages as he has suffered in consequence of the seller's breach of agreement to furnish fuel of a better quality. But the buyer must either receive or reject the entire shipment.

The last report of the Texas opinion takes up the question as to how damages for breach of a contract to deliver coal of a certain grade are to be measured. On this point the court decides:

"Ordinarily, if a contract for the sale of personalty, unperformed on the part of the seller, is broken by him, the measure of damages is the market price of such property, less the contract price, and the market price for this purpose must be determined as to the time and place of the delivery agreed upon.

It is ruled, however, that if at the time the contract is made, the seller has notice or knowledge that the goods are being purchased for sale in a particular market, or to be supplied in pursuance of a particular contract, he may fairly and reasonably be deemed to have made the contract in contemplation of that purpose, and to have assumed the risks thereby entailed; then, if he breaks his contract, damages for loss caused thereby, if not uncertain and remote, may be recovered."

*Attorney at law, St. Paul, Minn.

Recent Judicial Decisions

Duty of Operator to Miners—The duty which an operator of a mine must exercise to promote the safety of his employees is commensurate with the danger to them. (Oklahoma Supreme Court; Davis vs. Rock Island Mining Co.; 144 Pacific Reporter, 600.)

Interpretation of Leases—When the terms of a coal lease appear to be ambiguous, but the parties by their conduct have placed a practical construction on the doubtful provisions, the courts will enforce the lease according to that construction. (United States Circuit Court of Appeals, Fourth Circuit; Prudence Coal Co. vs. Perkins; 217 Federal Reporter, 569.)

Seller's Right to Rescind Contract—Under an agreement for a sale of coal deliverable in installments and providing for monthly settlements by the buyer on the 10th of each month, and authorizing rescission of the contract as to further deliveries on his failure to make payments on that date, the seller acted within its rights in cancelling the contract where remittance due in the seller's hands on the 10th was not mailed until the 11th. (Kentucky Court of Appeals, Southern Coal & Coke Co. vs. Bowling Green Coal Co., 170 Southwestern Reporter, 1185.)

"Chokedamp" and "Firedamp" Defined—Prooof of Negligence—Carbonic acid is commonly known in mining operations as "chokedamp," because of its extinguishment of flame and animal life. "Firedamp" consists of light carbureted hydrogen, and is so called because of its tendency to explode when mixed with atmospheric air and brought into contact with flame. In a suit to recover damages for death of a miner resulting from inhaling deadly vapors, the burden is on plaintiff to show that it was caused by some negligent act on the operator's part. (West Virginia Supreme Court of Appeals; Well's Administrator vs. Sutherland Coal & Coke Co., 83 Southeastern Reporter, 385.)

Contributory Negligence of Tipple Boss—A tipple boss, in moving a car to the tipple, discovered the presence of a timber too close to the track, jumped from the car to remove the timber, and in attempting to re-board the moving car was crushed between the car and a tipple post, and was fatally injured. He was in charge of the particular place and had the duty of inspecting the surroundings to determine their safety for himself and the other employees of the operator, and was therefore chargeable with knowledge of the proximity of the post to the track. Further, it appeared that he could have safely re-boarded the car by waiting until it had proceeded a little farther. Held, that he was guilty of contributory negligence, barring any right of recovery for his death. (Kentucky Court of Appeals; Louisa Coal Co. vs. Hammond's Administratrix; 169 Southwestern Reporter, 709.)

Liability for Injury to Children—The principles of law which render one liable for injury to a child of tender years, caused by a dangerous condition which is attractive to such children, where no attempt is made to guard against such accidents, cannot be applied to a case where a coal company permitted a lot of empty coal cars weighing 1000 lb. each to remain on a level track, several boys more than 15 years old rerailed a car which afforded an obstruction to movement of the other cars down a nearby grade, and in their running the cars a child ten years old was killed. "Here the coal company was not negligent, because there is no evidence here that these coal cars had ever been attempted to be operated by children of tender years, or that it was likely they could have been operated by them. But that is not all of this case: The coal company knew and recognized the fact that these cars were being thus operated, or might be so operated, and took precaution to prevent it, and had derailed a car at the connecting point of the side track on which they were standing with the main track. * * * If that car had been allowed to stay there, nobody could have operated those cars, and it could not have been moved by children of tender years—it could only have been moved by large boys or men." (United States District Court, Eastern District of Kentucky; Barnhill's Administrator vs. Mt. Morgan Coal Co., 215 Federal Reporter 608.)

Sociological Department

First-Aid Contest at Gillespie, Ill.

SYNOPSIS—A thoroughly democratic first-aid meet, which miners and operators together financed and conducted. Some youths also gave an exhibition of their skill. The discount or demerit list shows further improvements, the result, doubtless, of matured consideration.

The third annual meet, under the united auspices of the American Mine Safety Association, Local Union No. 730 of Mine No. 1, and the Superior Coal Co., was held Dec. 8 at the Colonial Theater, Gillespie, Ill. Nine teams contested in the full-team event, 18 teams in the two-man and 38 men in the individual event.

The judges were Dr. August F. Knoefel, president of the American Mine Safety Association, Terre Haute, Ind.; Dr. C. W. Hopkins, chief surgeon for the Chicago & Northwestern R.R., Chicago, Ill., and Dr. H. C. Blankmeyer, local president of the American Red Cross, Springfield, Ill. The recorders were F. F. Jorgensen, chief engineer for the Superior Coal Co., and H. D. Easton, instructor in the Illinois Miners' and Mechanics' Institutes. The managing committee consisted of J. Boston, chairman; J. R. Greer, secretary; J. Clarkson, C. Miller and J. Struthers.

John P. Reese, general manager of the Superior Coal Co., called the house to order at 9.30 and announced J. Boston as chairman of the day. After a short address of welcome by Mayor Rice, the individual contest started. Owing to the large number of entries and the consequent necessity of working in groups of six, this event occupied all the forenoon.

ONE-MAN EVENT

Only five minutes' time was allowed for the one-man event, which was as follows: Subject is supposed to be lying down and engaged in undercutting with a pick when he is caught by a fall of coal and has the right side of the scalp lacerated, the right ear torn off and the right jaw broken.

Few of the men were able to perform this test within the specified time. The rules of the contest allowed each man one minute in which to read the slip which stated the injuries, and then the slips were taken from the men and the word "Go" was given.

This contest resulted in four ties that were worked off immediately after dinner. The problem given for the tie was a dislocation of the right shoulder. Eight minutes' time was allowed, which was about twice as long as any of the men needed.

The winners and the prizes awarded for the individual contest were as follows: (1) Trophy cup, American Mine Safety Association medal, American Red Cross medal and $5 cash, won by J. Vrabel, Breese, Ill.; (2) Gold medal and $5 cash, won by W. B. Griffiths, Cuba, Ill.; (3) Silver medal and $2.50 cash, won by J. Struthers, Gillespie, Ill.

There were in all 18 prizes, consisting of cash and articles of utility.

TWO-MAN EVENT

Eight minutes' time was allowed for the two-man event, the following problem being offered: "While three men were engaged in taking down slate, one of them was caught and sustained a compound fracture of the lower third of the right leg, with bright red blood."

In this case also one minute was allowed each captain to read his slip, after which the first-aid work was done from memory. The allotted time proved ample.

The winners and prizes awarded in this event were as follows: (1) Two solid gold rings, presented by officials of the Superior Coal Co., and two American Red Cross medals, won by J. Struthers and W. Hood, Gillespie, Ill.; (2) Two pairs of gold cuff buttons, presented by officials of the Superior Coal Co., won by J. Easton and J. Fulton, Gillespie, Ill.

There were two other prizes, also donated by the officials of the Superior Coal Co.

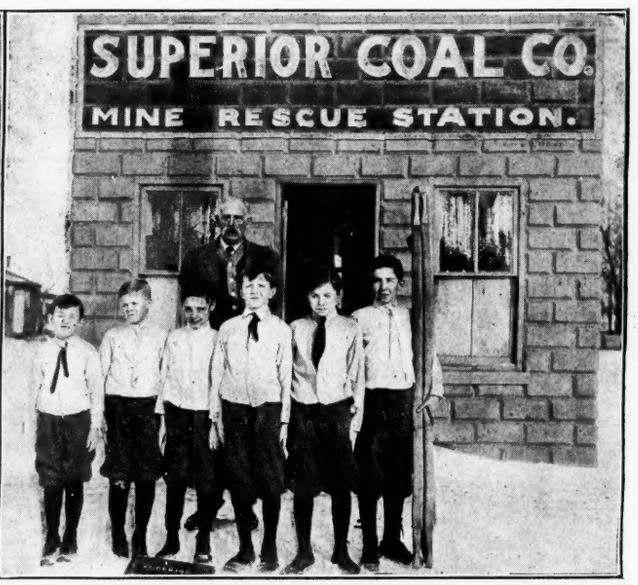
Undoubtedly Gillespie stands at the very head of first-aid work in Illinois, having the greatest number of first-aid teams and of trained men. The spirit of first-aid is in the very air of the town and is evidenced not only by contests, weekly meetings of first-aid societies, etc., but also by practical results obtained by its application in the mines.

BOYS' EVENT

After the two-man event, J. Boston introduced his boy team, comprising R. Harris, captain, age 12; J. Bergen, age

WINNERS OF FIRST PLACE, FULL-TEAM EVENT, NO. 3 TEAM, GILLESPIE FIRST-AID ASSOCIATION

From left to right: John Aitken, Fullerton Fulton, Sr., captain; Fullerton Fulton, Jr., James Fulton. S. Trainer, the patient, is not present.



JAMES BOSTON AND HIS BOYS' FIRST-AID TEAM, THE MEMBERS OF WHICH RECEIVED STATE DIPLOMAS

From right to left: Richard Harris, captain; Philip Shanahan, John Shanahan, James Bergen, Willie Carroll, Bartlett Carroll.

12; P. Shanahan, age 11; J. Shanahan, age 9; Willie Carroll, age 11; Walter Carroll, age 8.

The first problem given the boys was that of a simple fracture of the right femur, a simple fracture of the left forearm and a scalp wound on top of the head. The second problem was that of a fracture of the left collar-bone and shoulder.

These small boys performed their work so well that it looked as though they would prove dangerous rivals to teams composed of grown men. On Dec. 3, Thomas English, of the Illinois Mine Rescue Station Commission, examined these boys and they passed the state examination in first-aid in a creditable manner. Oscar Cartlidge, manager of the commission, presented the state diplomas and first-aid buttons to these boys at the contest and commended them for the excellent showing they had made in their examination. It is unusual for youths of such tender age to pass state examinations of this kind, but after witnessing their exhibition work it was evident to the spectators that they are well qualified and worthy of such an honor.

DISCOUNT OR DEMERIT LIST

The discounts in use are worthy of consideration, as they differ somewhat from those in Miners' Circular 15 of the Bureau of Mines, and perhaps suggest more mature consideration. As J. P. Reese and Dr. R. F. Knoefel, past and present presidents of the American Mine Safety Association, respectively, were both prominent in the program, the meeting was evidently official, and the discount list must have the support of leading officers of the association.

The last item in the list is entirely new. This refers to controlling hemorrhage. The 14th and 15th items, which also relate to blood control, are given increased weight, as is also "ineffective artificial respiration" and "incorrect treatment." "Failure to be aseptic" and "unclean first-aid material" are less heavily penalized. On the whole, we believe all these changes are good. Another improvement is an increase in penalty for splints improperly padded or applied.

We have added, for comparison, to the list given below the old National Mine Rescue and First-Aid Conference's discounts. The Gillespie demerits are the outcome of discussion of these earlier attempts at a fair assessment of defects in treatment, and we think show a big improvement. The changes in many cases are such as have been advocated editorially in "Coal Age." We have added the Utah Fuel Co.'s scale for comparison. It should be stated that not only the discounts, but their description and order have been changed. Hence, only the Gillespie counts are stated with verbal correctness in the table:

COMPARATIVE DEMERIT LISTS

	Gillespie Meet	Miners' Circular 15*	N.M.R. & F.A.C.†	U.F.C.‡
1. Not doing the most important thing first	6	5	2	5
2. Failure of captain to command properly	1	2	2	2
3. Slowness in work and lack of attention	2	4	2	2
4. Failure to entirely cover wound or ignorance of location of injury	4	4	2	2
5. Ineffective artificial respiration	11	10	2	5
6. Splints improperly padded or applied	6	2	2	2
7. Tight, loose or improperly applied bandages	5	6	2	2
8. Insecure or "granny" knot	4	5	2	2
9. Unclean first-aid material	3	5	..	..
10. Failure to have on hand sufficient and proper material to complete a dressing	3	5	..	..
11. Lack of neatness	2	2	..	2
12. Awkward handling of patient	4	5	2	2
13. Assistance lent by patient	3	5	3	3
14. Tourniquet improperly applied	7	5	3	5
15. Failure to stop bleeding	8	5	5	5
16. Not treating shock	5	5	5	5
17. Failure to be aseptic	7	10	10	5
18. Incorrect treatment	12	10	..	..
19. Failure to temporarily control hemorrhage until tourniquet is applied	7	..	..	..

*Published August, 1913, by the Bureau of Mines.

†Schedule of National Mine Rescue and First-Aid Conference, Sept. 23, 1912.

‡Utah Fuel Co. meets at Castle Gate, Utah, July 24, 1914, and Price, Utah, Sept. 26, 1914.

FULL-TEAM EVENT

The team contest closed the afternoon program. The nine teams, each consisting of five men, one of whom was the patient, were handled in groups of three. The problem was: A motor has "jumped" the track, knocking out the leg of a timber set and allowing the timber and slate to fall. The trip rider is caught under the slate and is found between the rails and in water. On examination it is noted that his right hand is cut off at the wrist, the fifth, sixth and seventh ribs of the right side are fractured and the outer third of the right clavicle has a compound fracture. The patient is in shock and is spitting blood.

After allowing 1½ min. for the captains to read their slips, 15 minutes' time was given for the work, and this proved more than was needed. In this event the captains retained their slips.

The winners and prizes were as follows:

(1) Superior Coal Co. trophy cup, five American Mine Safety Association medals, five American Red Cross medals, $20 cash donated by Local Union No. 730 of Mine No. 1—Won by Gillespie First-Aid Association No. 3 Team; F. Fulton, captain; J. Aitken, J. Fulton, F. Fulton, Jr., and S. Trainer, patient.

(2) Five gold medals presented by the Superior Coal Co. and $15 cash donated by Local Union No. 730 of Mine No. 1—Won by Cuba, Ill.; T. B. Trigg, captain; W. B. Griffiths, G. H. Trigg, J. Griffiths, and K. Hogan, patient.

(3) Five silver medals donated by the Superior Coal Co. and $10 cash given by Local Union No. 730 of Mine No. 1—Won by Farmington First-Aid Team; W. Brown, captain; W. Prosser, W. Crane, W. Watson, and R. Connell, patient.

There were four other prize-winning teams.

EVENING SESSION

At 7 p.m. the prizes were awarded by Dr. C. W. Hopkins, John P. Reese and others. The crowd was so great that it became necessary to close the doors of the opera house before the evening sesion began. The U. S. Bureau of Mines' kinematograph of coal-mining operations was a great drawing card. However, there was much interest shown by the public during the day and the house was full throughout the afternoon as well as in the evening.

The Superior Coal Co. trophy cup was awarded by Mr. Reese, who stated that this is the third and last contest for the cup. The present winners are to have possession of it for one year and then it becomes the property of the State of Illinois and is to be kept on exhibition at the Springfield Mine Rescue Station. It was first won Dec. 10, 1912, by Superior Team No. 1: J. Weir, captain; C. Miller, J. Cowden, J. Struthers and W. Hood.

It was won Dec. 9, 1913, by the Cuba team: T. P. Trigg, captain; J. Cooper, J. H. Trigg and W. Griffith.

A Miners' Co-Operative Store

By H. D. Easton*

The Gillespie Coöperative Society, of Gillespie, Ill., had a formal opening of its $1400 store building on miners' election day, Dec. 8, 1914. This is said to be the first miners' coöperative store in Illinois. The Scotch bandsmen made a picturesque feature with their pipes and kilts while furnishing the music for the occasion.

John H. Walker, president of the Illinois State Federation of Labor, was the speaker of the day. He enlarged upon the coöperative plan and encouraged the present society to look forward to the extending of their activities until a series of such stores are built over the state and all of these units do their purchasing through a coöperative wholesale house. This store, the first of the series, has already been occupied for a few weeks, but the formal opening was deferred until the day of the Gillespie first-aid meet. The speaking was in the Clan McIntosh Hall.

The store is of brick, two stories high, and has a large basement. The ground floor is used for groceries and foodstuffs in general, the second story is for dry goods and the basement for general storage. The building occupies a corner site on the main street which makes possible excellent window displays.

No One Can Hold over $25 of Second-Mortgage or over $500 of First-Mortgage Obligations

The Gillespie Coöperative Society was organized Apr. 21, 1913, with a capital of $1600. There are about 118

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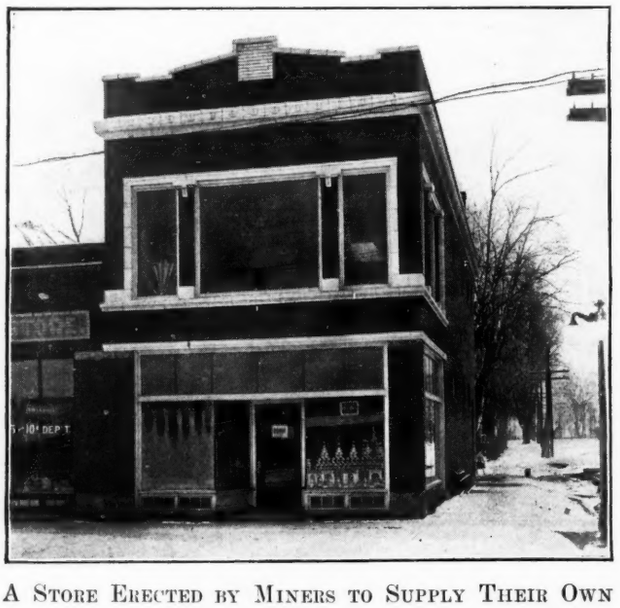
local members. To become a member, the applicant must buy a share at $5; each member is limited to five of such contributions. The money thus raised is called *share capital*. Each member is given a book with a number, on which his name does not appear, so that the private affairs of the shareholders are not divulged should anyone find the book.

After a member has purchased his five shares, he is allowed to deposit money which is called loan capital; but of this he is not allowed to obtain more than $500. These two forms of capital are somewhat like common and preferred stock; the share capital draws 5 per cent. interest and the loan capital 4 per cent., each being paid quarterly. In case of financial difficulty, the loan capital has first claim on any available assets.

The division of the net profits, after paying all running expenses and the interest on the two forms of capital, is proportioned according to the amount of purchases



A Store Erected by Miners to Supply Their Own Needs, Gillespie, Ill.

made by the members. A member buying $100 worth of goods would receive twice as much dividend as another who had purchased but $50 worth. Of course, none but members participate in this dividend.

Details of Management

Quarterly meetings are held and each member is fined 25c. for failing to attend a meeting. There is a board of directors consisting of nine men, three of whom are elected each quarter. There are three auditors, one of whom is appointed each quarter by the directorate. This plan always leaves experienced men both on the board and acting as auditors. A manager, the present incumbent being Herman Sies, is hired by the directorate. He, through the board, employs the necessary assistants.

The society plans to handle practically everything that a family needs and to carry none but first-class goods with prices according to value. No prices are to be cut. At present, the second story of the store is devoted largely to ladies' coats; there is to be special attention paid to certain lines in season and then, as the members become stocked up with the particular line, other goods will be taken up in the same manner.

Credit Given within $10 of Holding

The system of bookkeeping is greatly simplified by allowing and encouraging each member to purchase on credit goods of a value aggregating $10 less than his total capital. Fifteen dollars must be invested before credit can be given. As stated, a capital of $15 allows a $5 credit.

Many of the members prefer to invest their savings in loan capital rather than to leave the money in a bank. The Society not only allows 4 per cent. interest but compounds this increment quarterly.

The present board members are: Peter Harris, Jim Harris, Clyde Bernard, David Shaw, Doctor English, Mike Blaske, John L. Templeton, William Osborne and L. P. Preston. The other officers serve for one year and are: David McKaig, president, James Cowan, vice-president, Robert McKechan, secretary, and W. E. Schmidt, treasurer. Both the board members and officials are eligible for reëlection but cannot serve for more than two consecutive terms. The auditors' report shows the number of meetings attended by each official.

The coöperative plan is not new but is being followed with success especially in some colleges and universities. It is a long step from the old-time company store to the coöperative, but a step in the right direction. When miners become active in keeping up their own first-aid societies, coöperative stores, etc., they will have acquired an interest in local affairs that will lead very naturally to owning their own homes. All these movements favor the building up of a community of earnest, contented men and that in turn brings much help toward gaining peace and prosperity for both operators and miners.

Some Details as to Finance

[The auditors prepare a full and detailed report each quarter. From it we learn that $2802.25 of share capital is owned by 118 members, making an average $23.75 per member, which closely approximates the maximum possible holding of $25. The loan capital amounts to $3111.15 and is held by 91 members, making an average of $34.18 per loan holder. The largest holding is $325.89 and the smallest $0.11.

The grocery stock is valued at $2772.45, the dry goods at $2121.67. The cash on hand and balance in bank total to $2526.65. The total resources were $7921.44. There are $1374.14 of outstanding bills. The quarterly interest on shares and loan capital aggregated $46.63; the dividends on purchases for the quarter amounted to $423.47. The total sales are not given but the purchases of the store are recorded as $7702.68 in the three months past. During that same time $850.25 was paid for salaries and delivery of goods.

The figures are not large but the showing is commendable and it must be remembered that it closes already the fifth quarter of trading.—Editor.]

The number of coal mine disasters in the United States decreased 38 per cent. in 1913 according to the Fourth Annual Report of Joseph A. Holmes, director of the United States Bureau of Mines. "Although there was a slight increase in the number of fatalities in coal mines," says the report, "owing to two large disasters, it is gratifying to know that there was a reduction in the number of accidents. During the calendar year 1913 there were eight disasters in which more than five men were killed, as compared with 13 similar disasters in 1912, a reduction of 38 per cent.

Discussion By Readers

Mining Laws, Legislation and Mine Regulations

Letter No. 20—I want to suggest, in connection with the discussion of mining laws and legislation, that law makers can do much to increase safety in mines, if they will take up the matter of the fireboss and the shotfirer, and read into the mining laws of the state, a more definite statement of what these officials are expected to do during the working shift.

My observations lead me to the conclusion that, in many mines today, the fireboss and shotfirer have more work to perform than they can do properly in the time allotted them. In other words, they are unable to fulfill the requirements of the Coal Mines Regulation Act, in these circumstances and under the prevailing conditions. Such a state of affairs can only be remedied by a law fixing some standard amount of work that must be performed during the shift and which cannot be exceeded. In other words, the work a shotfirer is expected to perform should be so limited by law that it can be properly executed. If this matter be given proper attention by legislative bodies, I believe it will have a far-reaching effect and be of incalculable value in promoting safety in mines.

"Safety First" has become a very familiar phrase; and many large coal-mining companies are making it their slogan, for which they are to be commended. They reap the benefit, however, of their efforts in this direction quite as much as their employees. On the other hand, there are companies that do not push the "Safety First" proposition. I will not say that they do not favor it, however; but under the conditions so common to coal mining; such as a poor quality of coal, difficult mining conditions, keen competition in the markets and other causes, the adopted slogan "Safety First" is replaced by another, which is kept continually before the eyes of every mine official.

The cry is constant, "Coal! coal! coal!" No matter *how*—coal must be produced at the lowest possible cost, the only alternative being to close the mine. The company does not say "Take any and all risks to attain this result." But that is practically what it means. The factor of safety is almost wholly eliminated from the proposition. Consider, for a moment, the case of a fireboss in such a mine. His responsibilities, I venture to say, are equal to those of any other mine official. He is often required to fulfill the duties of both fireboss and shotfirer, in which case his responsibilities are increased three- or four-fold. In such capacity, he is called upon to fire all the shots in his section and to look after the general safety of all working places, traveling roads, ventilation, etc., as required by the Coal Mines Regulation Act.

It is easy to understand that, in order to do this work conscientiously and properly, the fireboss should have a limited number of places in his charge or a certain number of men. I have known cases where the fireboss had a larger territory than was possible to examine in strict compliance with the requirements of the act, within the time at his disposal. I have known such men to give up their positions, on that account, rather than be compelled to face the chance of a possible accident, for which they would be held responsible and the later investigation of which would result in their being deprived of their fireboss papers and stamp them as unreliable men.

In such cases, the position is again quickly filled, probably by a man who has recently succeeded in getting his papers and is elated at obtaining and anxious to hold the position he secures. It is this that makes him willing to take the chances mentioned. The miners and other workmen in the mine know well enough that the law is not being carried out, and they, in turn, get careless likewise.

Obviously, the result is bad and the moral seems to be quite clear, "If the boss does not enforce and carry out the Coal Mines Regulation Act himself, how can he expect his men to do so?" This condition naturally continues until the headlines of the daily papers announce the occurrence of a disastrous explosion. The later investigation fails to discover the actual cause of the disaster, though many theories are advanced to explain the mystery.

VIGILANT.

British Columbia, Canada.

Humidifying Mine Air

Letter No. 1—Referring to the interesting inquiry, in regard to the humidifying of mine air, COAL AGE, Jan. 2, p. 29, the statement of "Miner" that the humidity imparted to the air current by the exhaust steam is practically lost at a distance of 600 ft. from the bottom of the downcast shaft, shows that he is not putting enough exhaust steam into the air passing down the shaft, to produce good results at all times.

My own practical experience has taught me that, with the winter temperatures one may expect in Ohio, it will require 1 hp. of exhaust steam for each 1000 cu.ft. of air entering the shaft. This will, of course, depend, to a certain extent, on the distance it is necessary to convey the exhaust steam before it reaches the downcast shaft. No doubt the amount I have mentioned will seem excessive; but when one considers that the thermometer often registers below zero, and that it is necessary, therefore, to regard such conditions, it will be readily seen that the amount is not in excess.

I would recommend that "Miner" increase the amount of exhaust steam delivered to the air current; and make frequent tests with a sling psychrometer, until the readings show, say 93 per cent. relative humidity in the live workings, which he states are 4000 ft. inby from the downcast shaft. Such relative humidity should be obtained when the outside temperature is at or near the freezing point; and, then, if the temperature should drop for a few days, there will no doubt be sufficient moisture in the mine to tide over this condition.

I would also recommend the placing of a two-way valve on the exhaust header, so that it will be possible to regulate the supply of steam according to the requirements. When the steam supplied to the intake current is sufficient one should be able to notice a steam fog or mist for a distance of at least 1500 to 2000 ft. inby from the shaft, days when the outside temperature is zero or thereabouts. If necessary, a 1½-in. live-steam line could be connected with the top of the downcast shaft, for emergency use in extremely cold weather.

A very good test, for observing the dust conditions in the mine, is to place sheets of white paper at various points in the entries and the workings; and observe how much dust collects on these, in a certain time, say weekly. I feel certain that if "Miner" will work along these lines, he will be amply repaid.

GEORGE MORRIS,
Mining Engineer.

Ralphton, Penn.

Loading Coal by Machinery at the Face

I believe the inquiry of John Harvey, COAL AGE, Dec. 5, p. 920, refers to a mechanical coal conveyor, to be installed along the coal face, in a thin seam where it is impossible to take the cars because of a lack of headroom. As I have had considerable experience, in Scotland, in the handling of coal by means of the Blackett coal conveyor, at the working face of a thin seam of coal, I thought the following description would be of interest to Mr. Harvey and others.

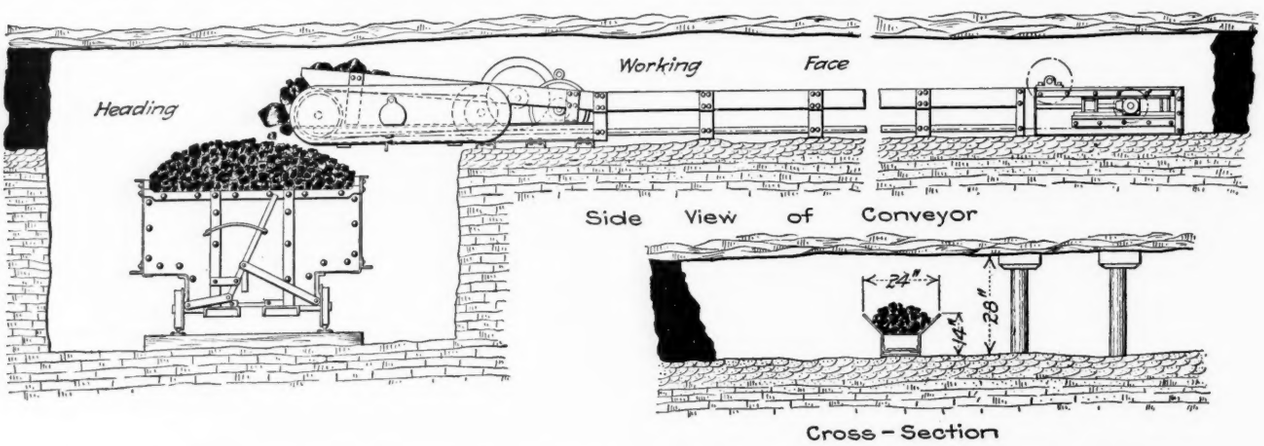
This conveyor, which was 300 ft. long, was installed at a cost of $2000. I believe the seam of coal described by correspondent is admirably adapted to the use of a conveyor, as the most important consideration when installing such a machine is a good roof and bottom that will allow sufficient open space for its operation, so that the conveyor will not be impeded by unnecessary timbers and fallen coal. The hard sandrock floor and limestone bottom will require little timbering in the open space along the face of the coal. I have seen the conveyor worked successfully in a seam 2 ft. thick.

The Blackett conveyor required two men, at the loading end of the machine, for topping and switching the cars as they were loaded and for operating the conveyor. The machine was run by a 7-hp., three-phase, alternating-current motor. The mine cars held only 8 cwt., or 896 lb. (taking the cwt. as 112 lb.). When running the conveyor at its full capacity, we could load 60 of these cars per hour; but this supply of coal could not be maintained throughout the day. The 10 men working on this 300-ft. face of coal would average from 230 to 240 cars of coal per day or, say something over 100 short tons; but this would run the conveyor scarcely four hours.

In the seam to which I refer, before the installation of the conveyor, the men averaged only 3 tons of coal per man per day. By means of the conveyor, this output was increased to from 8 to 10 tons of coal per man per day. Again, previous to the installation, it had been the custom to pay for the mining and hauling of the coal to the side track, a distance of ¼ of a mile, a rate of 62c. per ton. Boys were employed for this purpose, except where the grade of the road was too steep for them to handle the cars, where men had to be used. This rate for mining and hauling the coal to the side track was reduced by the installation of the conveyor to 31c. per ton.

I may say that this installation was made in a seam 4 ft. thick, having a dip of 1:6, which was increased in places to 1:4. The levels were driven on the strike of the seam, about 300 ft. apart, cutting off the rooms driven up from the level below. Main headings were maintained every 300 ft. apart, and these were equipped with a drum and brake operated as a self-acting incline.

When it was decided to install the conveyor at the face, this was straightened and opened to a width sufficient to admit the conveyor line and still give room for the mining of the coal. For this purpose, the roof required to be supported temporarily by timbers, and "chocks" were built below the line of the conveyor. From 3 to 4 ft. of bottom had to be lifted on the main heading to permit the mine car to pass under the loading chute at the end of the conveyor. In this system, as the longwall face advanced, the temporary timbers were removed at the face and the conveyor moved forward.



SECTIONAL VIEW AND CROSS-SECTION AT LONGWALL FACE, SHOWING A LINK-BELT, LOADING CONVEYOR

The advantages claimed for the conveyor and verified, in our case, are the following:

1. A largely increased output of coal, per man per day, as the miner having no cars to handle, devoted his time wholly to the production of coal.

2. Decreased cost of maintenance and operation, per ton of coal mined.

3. Better working conditions and less timber, rails, etc., required, owing to the more rapid advance of the working face.

4. A more satisfied class of workmen, because the laborious handling of cars is avoided in this system.

THOMAS MULHOLLAND.

Ensley, Ala.

[In response to our inquiry, in reference to the installation of longwall conveyors, in the working of thin seams of coal in this country, the Link-Belt Co. has kindly sent photo of this machine, which we have reproduced, together with the following information:

Two of these machines were installed in the 28-in. veins of the Pennsylvania Coal Co.'s mines, at Dunmore, Penn., last April. These machines were set up on 250-ft. centers, in 16-ft. sections. The conveying medium consists of a single strand of H-type chain, having a 5-in. pitch and being 9 in. wide. The chain, which conveys the coal along a trough as illustrated in the accompanying figure, is operated at a speed of about 90 ft. per min. This machine was installed on a contract guaranteeing a capacity of 10 tons of run-of-mine anthracite per hour, with uniform loading. Each machine is equipped with a 7½-hp., back-geared electric motor, the gearing being provided with metal guards. As the coal face advances, the machine is moved forward by hand, using crowbars, chain blocks, or other simple means.

Two similar machines were also installed at the Hillside Coal & Iron Co.'s mines, at Mayfield, Penn., last September. The machines are in constant operation and giving good satisfaction, by accomplishing the work for which they were designed.—EDITOR.]

The Foreigner in Mining

Letter No. 12—The recent discussion of the foreigner in coal mining has been of great interest, particularly to the foreigners themselves—those who could read and understand English. There are many such among COAL AGE readers and they have read every word thus far written. I am one of these and was glad to notice Mr. Lantz' suggestion, in Letter No. 10, COAL AGE, Dec. 26, p. 1035, that the views of foreign-born mining men who have become Americanized and have adopted American standards of living would be interesting and valuable.

My practical experience in coal mining, during the last 20 years, has shown me that there is much unfair treatment of the foreigner in mining and that he is not given the same chances to advance and improve himself that are afforded American miners. As an illustration of this fact, I will cite one particular case in which a few native-born foreign boys had attended a night school where they studied for fireboss certificates. They, later, passed the examination successfully, received certificates of competency and filed their several applications for the position of fireboss, in the mine office. When there was an opening, however, the mine foreman sent for a few good American-born men; and the superintendent, who was a college-educated man, but knew little more of mining than an ordinary wood-chopper, was induced to appoint the newcomers, instead of the foreign-born boys who should have stood the first chance. In this way, the mine foreman actually put one over on the mine superintendent when he shoved these men back who were in every way competent to fill the position and brought new men to the mine to fill the places.

One may ask, "What chance does that give a foreigner, or what encouragement does it offer him to educate himself?" Had the mine foreman, in this case, been square and the superintendent a man of experience, and these men had been shoved along as they were able to go, they, in turn, would have started a hundred others on the same track, as it would have proved the benefit they had received from their education. But, I have not told all; the worst was yet to come. Later, when hard times occurred, the foreigners and their boys were laid off entirely. The mine foreman had no work for them; but single men—Americans—were kept at work, while these married foreigners, many having large families, were thrown idle. The boys who had studied were ridiculed by their less ambitious fellows, who taunted them with, "Well, aren't you fools; never going to get a job of firebossing; youse won't never be American citizens—not with such dirty officials as we have to work under"; and other like remarks.

I want to say, in closing, that many coal operators make a mistake in their treatment of the foreigner, and particularly the native-born foreigner. It is a fact worth observing that the children of these foreigners are being educated. They are ambitious; many of them are looking forward to a college education, and are making rapid progress. Few of them, indeed, will be contented to draw coke or dig coal all their lives.

It would be interesting and instructive to know what percentage of English, German, Swedish and Bohemian miners has been killed in the mines, during the past year. I believe they are the best class and highest grade of miners now employed in the mines of this country.

A FOREIGNER.

Mt. Pleasant, Penn.

Letter No. 13—I have been much interested in the discussion now in progress in COAL AGE, regarding the education of the foreigner. Inasmuch as one correspondent invites the opinions of foreigners, I am induced to break into the discussion.

As one who came from Europe, direct to the coal fields, several years ago, I have an intimate knowledge of the character, habits and aspirations of those humble persons now arriving from the Continent in such numbers. I have been in close working contact with many of this class, who, like myself, have become more or less Americanized. Also, having previously had many years' practical experience in educational matters, especially the education of workingmen, I have unconsciously formed the habit of observing and comparing the educational standards of the communities in which it has been my fortune to dwell. In this respect, I have had many opportunities of comparing the general education of the foreigner with that of the American workman in the coal fields of this country. I regret to say that the result has not always been to the credit of the American miner.

Many of the aliens who come direct to the coal fields from the mining countries of Europe are experienced miners and possess a good rudimentary education. But, the American miner is very prone to look upon even these with disdain, simply because they do not speak the language or understand what is said to them. There are besides, of course, a large number of a lower grade of for-

eigners, who reach the coal fields from the farming districts of Europe. As a rule, these gravitate to the coal fields from the larger cities where they have been long enough to obtain a fair knowledge of the country and the language. The most of this class do not aspire to enter the mines; and only do so because of their need of work or at the solicitation of friends already in the mines.

What the foreigner most needs is to learn the language sufficiently to enable him to speak it and understand what is said to him. They pick up this knowledge more rapidly in their daily work than by attending educational classes. In my opinion, any further education given them should be in the nature of acquainting them with the dangers of mining and the duties and responsibilities of citizenship in this country. The work of making a good citizen out of the foreigner is too often neglected.

Anyone familiar with the situation knows that far too many foreigners come to this country for the purpose of making easy money in a short time. They are sending this home to pay for the farm that they are anxious to go back and work. It would be better for the coal districts and the country at large if the foreigners we employ were given to understand that they must get their families here and be naturalized within a given time, say a year. It is not wisdom to have so many of these men crowded into the mining camps and living in the most degraded manner possible—often like hogs. The general tone of the camp is lowered because of their inordinate desire to save money and send it home. The natural result is to prejudice the mind of the American workman, who fails to realize that this is not their normal habit of life when in their own country.

To force this class of foreign labor to *declare their intention of becoming citizens of this country, within a year,* would probably mean a reduction of their number in the coal fields; but the grade of labor remaining would be of a far superior quality, and the talk of their education would be unnecessary.

It has been my observation that where the population in the coal fields consists of foreigners who are married and settled with their families, in their own homes, the workers prove to be the most reliable and respectable it is possible to employ. I believe, therefore, that everything should be done, in the way of education, to persuade or even compel this class of labor coming into the country to declare their intention of settling here and becoming good citizens. In closing, I may say that, while I believe in education, I am convinced that the foreigner needs no more attention, in this respect, than the average American workman.

WESVANIA.

———, W. Va.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

CENTRIFUGAL PUMPS

The low cost of electricity and its increasing application for power and lighting, in mining work, together with the ease of installation and the flexibility and small expense for maintenance of the system has resulted in the development and successful adaptation of the centrifugal pump to mining conditions and requirements.

The centrifugal pump is, by its very nature, an electrically driven pump, owing chiefly to the high speed of rotation required for the development of its centrifugal force, and the same high speed of rotation is the prime feature of the dynamo or electric motor.

Efficiency—Motor-driven pumps of the centrifugal type present features capable of developing high efficiencies. It is now possible, by the improved design of the impeller and its casing, to obtain the same high efficiencies for all heads up to 250 ft., which fact alone adapts them to mining use.

What is generally understood as the "pump efficiency" is the **ratio of output to input;** which in centrifugal pumps is the ratio of the work performed (ft.-lb. per min.) to the brake horsepower reduced to the same basis. The "overall efficiency," which is a term sometimes used, includes the combined efficiencies of the motor and the pump. It is the ratio of the work performed (ft.-lb. per min.) to the kilowatts delivered to the motor reduced to the same basis. The efficiencies of the better class of these pumps vary from 45 to 78 per cent., depending on size of pump and head.

Rated Size of Pump—Centrifugal pumps are rated, in respect to size and capacity, by stating the diameter, in inches, of the discharge. Thus, an 8-in. centrifugal pump is one having a discharge connection 8 in. in diameter. This is also called a "No. 8 pump."

Size Required for Given Capacity—It is possible to estimate approximately the size or number of pump required to deliver a given quantity of water, G (gal. per min.), on the basis of an assumed average velocity of discharge of, say 12 ft. per sec., for heads varying from 80 to 90 ft.; and assuming, further, that this velocity will vary approximately as the square root of the head.

For example, calling the required diameter of discharge d, in inches; the desired capacity of the pump G, in gallons per minute; and the given head h, in feet, the calculation is as follows, on the basis of a velocity of 12 ft. per sec., under an average head of 85 ft.:

$$G = \frac{60 \times 12 \times 12\,(0.7854\,d^2)}{231}\sqrt{\frac{h}{85}} = 3.186\,d^2\sqrt{h}$$

and, for the required diameter of discharge,

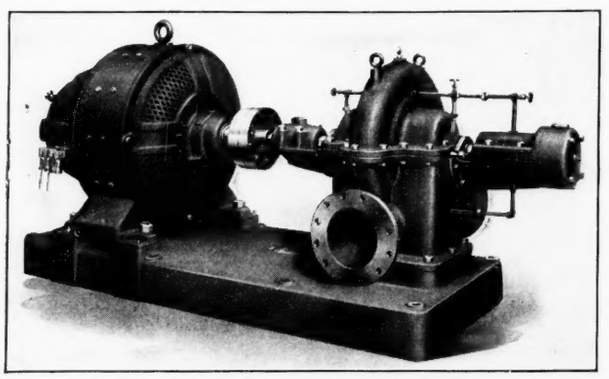
$$d = 0.56\sqrt{\frac{G}{\sqrt{h}}}$$

However, since the sectional area of the volute, at the cut-off, is the factor determining the discharge, the above formula, at times, gives rise to misunderstanding.

The Coal Age Pocket Book

The Single-Stage, Centrifugal Pump—There are two general types of centrifugal pumps; namely, **volute** and **turbine** pumps. The "volute" type receives its name from the spiral form of casing that surrounds the impeller and conducts the water flowing from the impeller to the discharge pipe or nozzle. Volute pumps are generally single-stage pumps. The volute is the standard type of centrifugal pump, for all capacities and for all heads up to 250 ft.

The accompanying figure shows an outside view of a 10-in., double-suction, volute, motor-driven pump. All centrifugal pumps have the following essential elements or parts



CAMERON TEN-INCH, DOUBLE-SUCTION, MOTOR-DRIVEN, CENTRIFUGAL PUMP

that combine to form the pump proper: **1.** A shaft that transmits the power from the motor to the pump. **2.** An impeller mounted on the shaft and rotated by it at a high speed. **3.** A casing that surrounds the impeller and confines the water within the pump till it is finally discharged at the nozzle or into the column pipe leading to the surface.

Advantages of Centrifugal Pumps—In this type of pump there is the entire absence of complicated parts such as valves, pistons, etc. Less floor space is required; cost of installation and maintenance is lower for the same service; and the action of the impeller is continuous, producing a steady discharge and eliminating shock and noise. The interior of the pump is readily accessible for inspection without disturbing any pipe connections or the alignment of the pump.

Inquiries of General Interest

The Simple Vernier

What is the principle of a simple vernier, by which it is possible to read with accuracy to a smaller division than that on the scale? Are all verniers constructed and read alike?

SURVEYOR.

Bethlehem, Penn.

The principle of the vernier depends on its divisions being less or greater than the divisions of the scale, by a certain fractional or decimal part of the scale unit. There are two kinds of verniers—the *direct* and the *retrograde*. In the direct vernier, the divisions on the vernier are shorter than those on the scale. In the retrograde vernier, which is not so common as the direct, the vernier divisions are longer than those of the scale.

A scale may be graduated for any unit of measure; as, for example, feet, inches, degrees, etc. The vernier may, then, be so divided as to read any fractional or decimal part of such unit.

Referring to the accompanying figure, the divisions of the scale marked 1, 2, etc., may represent feet or inches.

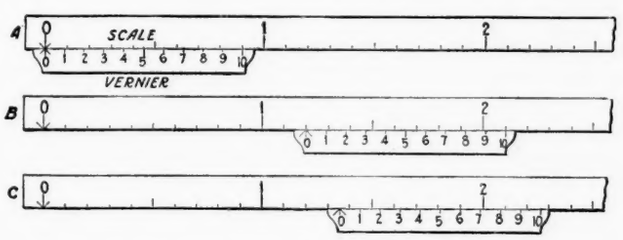


DIAGRAM ILLUSTRATING THE SIMPLE VERNIER AND SHOWING THREE POSITIONS ON THE SCALE

These being divided, in this case, into ten smaller divisions, this scale is a decimal scale and each of the smaller divisions marks $^1/_{10}$ of the scale unit, whatever this may be.

Now, in order to divide these smaller divisions again into ten parts, each of which will measure $^1/_{100}$ part of the scale unit, it is necessary to so graduate the vernier that ten divisions shall be equal to nine divisions of the scale (direct vernier) or to eleven divisions of the scale (retrograde vernier).

The vernier shown in the figure is direct, ten of its divisions corresponding to nine divisions of the scale, as shown at *A*. This makes each division of the vernier measure $^9/_{10}$ of a division of the scale. In other words, each vernier division is $^1/_{10}$ less than a division of the scale; and this difference measures, therefore, $^1/_{100}$ of the scale unit.

When reading, the position of the index of the vernier is first read on the scale. In the figure, the vernier is shown in three positions; at *A*, the vernier index reads zero; at *B*, the vernier index reads 1.2; at *C*, the vernier index reads something more than 1.3; and the excess must be read from the vernier, by observing the lines of coincidence where a vernier division exactly corresponds to a division of the scale, which is here the sixth division of the vernier. Since each vernier division is less than the scale division by $^1/_{100}$ of the scale unit, it is evident that the vernier index has advanced $^6/_{100}$ of the scale unit beyond the reading 1.3; and the full reading, in this case, is therefore 1.36.

It is important to notice that a direct vernier must be read forward, in the same direction as the scale is read. In a retrograde vernier, the vernier index is at the other end of the vernier, and the vernier is read back from this index or in the reverse direction from the reading of the scale.

Problem in Surveying

Kindly explain how the horizontal and vertical distances are calculated from the pitch distance, in surveying a breast or heading in an inclined seam. For example, if the heading has a pitch of 45 deg. and the measurement is 200 ft. on the pitch, what is the corresponding horizontal distance and the vertical rise?

ROBERT KRAMER.

Trevorton, Penn.

It is customary when surveying on steep inclines to make all measurements on the pitch or the dip of the seam, as the case may be. In order to reduce pitch or dip measurements to the horizontal and vertical distances, it is usual to employ a table of sines and cosines. For example:

Horz. distance = *pitch distance* × *cos pitch angle*

Vert. distance = *pitch distance* × *sin pitch angle*

The sine and cosine of 45 deg. are each 0.707, as given by the table of sines and cosines. Therefore, for a distance of 200 ft. measured on the pitch,

Horz. distance = 200 × 0.707 = 141.4 *ft.*

Vert. distance = 200 × 0.707 = 141.4 *ft.*

Since the angle of inclination or the pitch angle, in this case, is 45 deg., the three lines representing, respectively, the pitch, the horizontal and the vertical distances, form a right isosceles triangle, the horizontal distance being equal to the vertical distance, and the pitch distance being the hypotenuse. In this case, therefore, the square of the pitch distance is equal to twice the square of either the horizontal or the vertical distance, according to the rule, in geometry, that the square of the hypotenuse of a right triangle is equal to the sum of the squares of the two sides, which gives, in this case, the two sides being equal,

$$Horz.\ or\ vert. = \frac{pitch}{\sqrt{2}} = \frac{200}{1.414} = 141.4\ ft.$$

Also, since the sine of 30 deg. or the cosine of 60 deg. = 0.5, the vertical distance on a pitch of 30 deg. is always one-half of the pitch distance; and, likewise, the horizontal distance on a pitch of 60 deg. is one-half the pitch distance.

Examination Questions

Miscellaneous Questions

(*Answered by Request*)

Ques.—Calculate the following notes taken from a "level book"; and give the elevation of each station referred to the bench mark, whose elevation is 20:

Sta.	B.S.	I.S.	F.S.	Remarks
B.M.	6.70	....	....	Elevation of bench = 20
1	....	3.40	....	
2	....	4.20	....	
3	....	2.80	....	
4	....	5.70	....	
5	....	1.80	....	
6 T.P.	....	....	2.90	Sta. 6 = turning point
	8.30	....	....	
7	....	7.40	....	
8	....	6.50	....	
9	....	2.80	....	
10	....	8.40	....	
11	....	3.50	....	
12	....	2.40	....	
13	....	4.70	....	
14 T.P.	....	....	1.80	Sta. 14 = turning point
	5.40	....	....	
15	....	2.20	....	
16	....	6.80	....	
17	....	4.30	....	
18	....	....	3.82	

Ans.—In leveling, the backsights (B.S.) are all plus (+) sights, and must be added to the elevation of the bench mark (B.M.) or turning point (T.P.) on which the rod is held. The intermediate sights (I.S.) and foresights (F.S.) are all minus (—) sights and must be subtracted from the height of instrument (H.I.) to find the elevation of the station, which gives the following:

Sta.	B.S.	I.S.	F.S.	H.I.	Elevation
B.M.	6.70	....	....	....	20.00
1	....	3.40	....	26.70	23.30
2	....	4.20	....	....	22.50
3	....	2.80	....	....	23.90
4	....	5.70	....	....	21.00
5	....	1.80	....	....	24.90
6 T.P.	....	....	2.90	....	23.80
	8.30	....	....	32.10	....
7	....	7.40	....	....	24.70
8	....	6.50	....	....	25.60
9	....	2.80	....	....	29.30
10	....	8.40	....	....	23.70
11	....	3.50	....	....	28.60
12	....	2.40	....	....	29.70
13	....	4.70	....	....	27.40
14 T.P.	....	....	1.80	....	30.30
	5.40	....	....	35.70	....
15	....	2.20	....	....	33.50
16	....	6.80	....	....	28.90
17	....	4.30	....	....	31.40
18	....	....	3.82	....	31.88
	20.40		8.52		

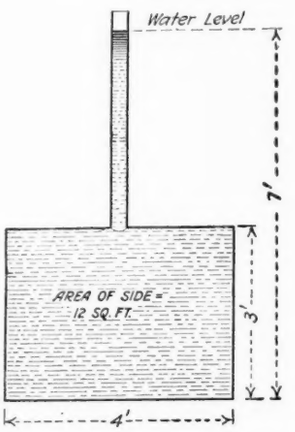
Proof 20.00 + 20.40 — 8.52 = 31.88.

Ques.—Explain how it is that finely pulverized clean coal ash when mixed into a stiff paste to which some common table salt (NaCl) is added makes a very good temporary substitute for fireclay.

Ans.—Ordinary coal ash contains dioxide of silica (SiO_2), sesquioxide of iron (Fe_2O_3), oxide of alumina (Al_2O_3), oxide of calcium (CaO) and magnesium oxide, (MgO). The addition of common salt or sodium chloride (NaCl) and water (H_2O) provides all the constituents of plastic fireclay, except the oxides of sodium and potassium, and the latter is often present either as the monoxide (K_2O) or the unstable peroxide (K_2O_4). There is therefore formed, by the addition of the salt and water, a mechanical compound closely resembling fireclay.

In the case of an ash from which considerable clinker has been sifted, we find also sulphate of lime ($CaSO_4$) and phosphoric acid in some of its forms, all of which deteriorate the value of the clay. Fireclay can thus be made for emergency use, for temporary repairs to fireboxes, etc.

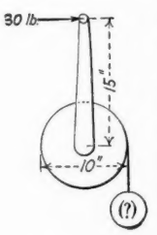
Ques.—Find the total pressure on the vertical side and total pressure on the bottom of the rectangular tank illustrated in the accompanying figure. The size of the tank is 4x4 ft. on the bottom and it is 3 ft. high. Into the top of the tank, which is closed, is inserted a pipe. Water is poured into this pipe and fills the tank, and also the pipe to a depth of 7 ft. above the bottom of the tank.



Ans.—The area of the vertical side of the tank is $3 \times 4 = 12$ ft. The water pressing on this vertical side has a mean head equal to the depth of the center line of this side below the level of the water in the pipe, or $7 - 3/2 = 5\frac{1}{2}$ ft. The total pressure on the vertical side is, then, $12 \times 5.5 \times 62.5 = 4125$ lb.

The area of the bottom of the tank is $4 \times 4 = 16$ sq.ft. The head of water pressing on the bottom is 7 ft. The total pressure on the bottom of the tank is, then, $16 \times 7 \times 62.5 = 7000$ lb.

Ques.—What weight will a man be able to lift with a windlass, by exerting a constant force of 30 lb. on the handle? The radius of the handle is 15 in. and the diameter of the windlass barrel 10 in.



Ans.—In this case, the lever arm of the force exerted is three times that of the weight lifted, the former being 15 in. while the latter is one-half the diameter of the drum, or 5 in. Therefore, the weight lifted will be three times the force exerted, or $3 \times 30 = 90$ lb.

Ques.—A certain volume of air is under a pressure of 15 lb. per sq.in., at a temperature of 36 deg. F. What temperature will be required to increase the pressure of this air to 23 lb. per sq.in., assuming the volume remains unchanged?

Ans.—Assuming that the given pressures are the total pressures above a vacuum and remembering that, for the same volume of air, the absolute temperature varies directly as the absolute pressure exerted on the air and *vice versa,* which makes the absolute-temperature ratio equal to that of the absolute-pressure ratio; and calling the required temperature of the air t, we have

$$\frac{460 + t}{460 + 36} = \frac{23}{15}$$

$$t = \frac{23\ (460 + 36)}{15} - 460 = \textit{say}\ 300°\ F.$$

Coal and Coke News

Harrisburg, Penn.

Three indictments, with a total of 126 counts, charging the Philadelphia & Reading Ry. Co. with violations of the interstate commerce laws relating to the transportation of anthracite and bituminous coal between Philadelphia and New England points were found by the Federal Grand Jury on Jan. 7. No date has as yet been fixed for the trial of the case.

Fifty-one counts in one indictment charge the railway company with failing to file with the Interstate Commerce Commission schedules of its rates and charges for coal transported over the Philadelphia & Reading transportation line of barges and tugs, which it owns, running between the coal fields in Pennsylvania and New England ports.

The indictment covers a period from Oct. 1, 1913, to Apr. 1, 1914, and involves continuous shipment of anthracite from St. Clair and Schuylkill Haven, Penn., to numerous points, including Boston, East Cambridge, Charleston, Brookline, Milton and Salem in Massachusetts and to Portland, Gardiner, Rockland and Bar Harbor, Maine.

There is also a charge against the company that it favored some of its shippers, especially the Philadelphia & Reading Coal & Iron Co., by granting them privileges and facilities in transportation that were not accorded to their competitors.

By its ownership of mines and rail and water lines the component parts of the Reading system have obtained a large control over the supply and output of coal through all of the New England territory. This power of control is largely attributed to the fact that the railway company is not dependent upon the rail routes to New England for service in carrying the coal but through its ownership of the barge line it is enabled to transport anthracite to New England at a cost lower than that imposed upon its competitors.

The railway company has never regarded its barge line to be within the regulations of the Interstate Commerce act, and upon this theory, has never filed with the commission tariffs showing its rates of transportation over the water route.

Should it be decided by the court that the barge line rates and charges must be published in tariffs and filed with the commission, all shippers will be given the privilege of using the barge line under exactly the same conditions as are now enjoyed by the Philadelphia & Reading Coal & Iron Co.

In the second indictment the railroad is charged with granting concessions to favored coal shippers by failing to collect demurrage charges on carloads of coal that have been held in the railway's yards more than 48 hours after the cargo reached Port Richmond. For 48 hours after a shipment reaches the point of destination it is held by the railway without charge to the consignee. For each succeeding day a carload is held in the yards, a demurrage of $1 is to be charged, according to the regulations of the Interstate Commerce Commission.

The indictment cites 50 instances where favored shippers had their cars detained at Woodlane yards, 8 miles from Port Richmond for many days beyond the time limit allowed for discharging the cargo, but the railway company made no claim for demurrage.

The period of these alleged violations is from Mar. 1, 1913, to Apr. 1, 1914, and are connected with bituminous coal shipped from West Virginia to Port Richmond, for transshipment to other points. Among the shippers alleged to have been favored by this method are the Mosco Iron Co.; the Glen Brook Coal Co., and the Hutchinson Coal Co.

Competitors of these companies, it was said, were not allowed these concessions, but were compelled to take their cargoes at their destination in Port Richmond, and if delay occurred necessitating a detention of 48 hours they were compelled to pay the demurrage charges.

The third indictment is substantially of the same character as the preceding one. It charges that between July 1, 1913, and Apr. 1, 1914, the railway company failed to collect demurrage on 25 rail shipments from mines to Port Richmond.

Whitney & Kemmerer, Blair Parke Coal & Coke Co., and the Maryland Coal Co. are cited as being favored also by the railway company in being relieved of demurrage charges.

After finding the indictments, it was stated that the aggregate of fines that could be imposed should the Government prove its charges would be $1,650,000, but it is not likely that the court would go to that extent in inflicting punishment.

It was stated that the questions of law involved in the cases are very interesting, and of importance not only to the railway company, but to the public as well. They concern the shipment of both anthracite and bituminous coal from points along the lines of the Reading railway and its connecting carriers to points along the coast of New England.

PENNSYLVANIA

Anthracite

Nanticoke—The distinction of having the greatest output of coal of any breaker in the anthracite region for the year 1914, is held by the Truesdale colliery of the D. L. & W. R.R. Co. The Prospect colliery of the Lehigh Valley Coal Co. ranks second in the list in coal production and is closely followed by the Woodward colliery of the Lackawanna company. The figures for the production in 1914 are as follows: Truesdale, 1,152,201; Prospect, 1,097,973; Woodward, 1,053,461. A feature in regard to the success of the Truesdale colliery is that it is the second colliery in the anthracite region to be electrically operated.

Scranton—Arrangements have been completed by the Delaware, Lackawanna & Western Coal Co. to give moving picture shows to all the employees, depicting safety means and methods and showing the right and wrong way of doing work in the mines. The company thinks by this method all the employees can be sufficiently schooled and educated as to the right way to prevent accidents and also how to act in case of accidents. Prizes amounting to over $100 will be given by officials of the company to employees at any of its collieries who submit the best suggestions for the promulgation of the safety movement. These suggestions must be written and handed in before Mar. 1, and each contestant is limited to 1000 words.

Avoca—That the property and employees of the Pennsylvania Coal Co., at its No. 6 colliery, are well protected from fire, was shown on Jan. 9, when a fire drill was held at 10:09 a.m. Forty-eight seconds after the sounding of the five short calls of the Erie system, several different plugs were opened, the hose stretched and ready for service and the entire 187 men and boys of the breaker were out in the open. This is the fastest time yet made. This is the same set of fire fighters which last year made the record of 53 seconds to prepare for action and this time was never equaled until they lowered it themselves. The test was an unexpected one, it never being thought that with the frigid weather a call would be made.

Hazleton—Cold weather found most of the springs and bore holes dry with no possibility of reopening until the frost leaves the ground in the spring. Mines are hampered for lack of water to run their boilers and pumps and devices to melt snow and ice are being installed at many collieries. With business brisk at the mines, suspension because of drought would mean heavy losses.

Silver Brook mine covering an area of 7½ square miles and containing several beds of coal, aggregating 22 ft. in thickness, which have never been touched, may be opened by the Lehigh Valley Coal Co. The property which was leased to the J. F. Wentz Coal Co., of Philadelphia, was abandoned and filled with water in 1906. It is stated that the coal deposits have been merely scratched and the resumption of operation will mean the employment of 1500 men.

Harrisburg—It is stated that the action in equity involving construction of the term "miner" in the Mine Foreman's Certificate Act, is to be appealed to the Supreme Court. Judge McCarrell, of the Dauphin County Court, declined to enjoin Chief of Mines James E. Roderick from issuing certificates to men who have not served five years as actual diggers of coal, holding that the Legislature did not make that a requirement.

Wilkes-Barre—When a half dozen employees at the Henry colliery of the Lehigh Valley Coal Co. at Plains were unable to show their union buttons recently, 700 men and boys, mem-

bers of the United Mine Workers of America, declared a strike, and operations at the colliery came to a standstill.

Bituminous

Uniontown—Henry Ainsley was instantly killed and Harry Capitol was severely injured, Jan. 8, when the insulation on a 550-volt wire in the Evans No. 3 mine wore off and charged an electric coal cutter. When the men started the machine, Ainsley was thrown to the floor of the mine and came in contact with the rail which had been also charged. Capitol was burned on hands and arms.

Washington—Following the settlement of the action brought by the employees against John M. Greek, president of the Greek Coal Co., operating near Washington, for failure to pay his employees their wages, it was recently announced that the mine would reopen, giving employment to about 75 men.

Connellsville—It is expected that the coke industry will shortly reflect the pronounced improvement which has already taken place in the steel trade. Connellsville coke is now showing but little change over former figures, being approximately on a basis of 200,000 tons weekly, production and shipments being about equal.

Charleroi — Announcement was recently made that the Eclipse and Alice mines of the Pittsburgh Coal Co. would be started in full shortly, giving employment to 500 to 600 men each. Various factories and mills, as well as other industrial works, some of which have been shut down for months, are resuming operations.

Fredericktown—There does not seem much chance of Vesta No. 5 mine resuming operations for some time. This mine is one of the largest along the Monongahela River and is operated by the Jones & Laughlin Co. Commissaries have been opened to relieve the suffering of the poorer families. This mine when in operation employs between 1000 and 1200 men.

Monongahela City—The local Pittsburgh Coal Co. officials have received notices that mine foremen, firebosses and other minor officers shall at once sever their connections with the so-colled "booze clubs" or resign their positions.

Martin—The Martin mine of the Republic Iron & Steel Co., which has been on fire since Nov. 4, 1914, has as yet not been drowned out, though the pumps have been almost continuously in operation.

WEST VIRGINIA

Bluefield—Many Italians are making their way to Norfolk and other seaport towns, from whence they will sail to the Old Country or go to some other part of this, where they can secure employment. It is understood that some of the coal companies in the nearby fields, are unable to give all their men work, and this is probably the reason that so many are leaving this region.

Fayetteville—One of the largest mortgages ever placed on record in this county, was filed recently. It is from the Sunday Creek Co. to the U. S. Mortgage & Trust Co. and consists of 160 pages. It is issued for the purpose of refunding indebtedness represented by unpaid bonds, amounting to $3,838,000, issued in April 1910. Interest unpaid on these bonds amounts to $95,950 and the amount of the new bonds issued is $3,934,000. The bonds are to run 34 years at 4% interest. Coal lands and property in Ohio and West Virginia are covered by this issue.

Charleston—Advance pages of the biennial report of Earl A. Henry, chief of the Department of Mines, show that the production of coal in West Virginia, for the fiscal year ending June 30 last was the greatest in the history of the state. From 1005 mines in 33 counties there were produced during the year 65,783,088 tons of coal, as compared with 61,770,352 tons for the previous year. McDowell County led in production, although the output there showed a decrease from preceding years.

Huntington—The Lorain Dock & Coal Co., which has heretofore been one of the largest operators in the eastern Ohio field, announces the purchase of 14,000 acres of coal land in Logan County, which it intends to begin work upon at once. Reports vary as to the company's plans with reference to its eastern Ohio properties, J. W. Johnson, general manager, being quoted as saying that the company will not permit them to remain idle any longer than necessary by reason of the labor trouble, while it has several times been declared that the company will remove all equipment possible to its new West Virginia properties. In connection with the latter report, it is stated that the company will lease its Wheeling Creek and Lansing mines to the Youghiogheny & Ohio Coal Co., which owns adjoining properties, and which will operate the mines named from its own openings.

VIRGINIA

Bristol—With apparent prospects for a revival in the industrial world, there are evidences of renewed activity in the Virginia and Kentucky coalfields. In eastern Kentucky, the mining plants of the Consolidation Coal Co. and the Elkhorn Mining Corporation working in the field contiguous to the Virginia line are resuming operations, and it is expected that all the mines in that region will be in full operation within the next month or thereabouts. Hundreds of men have been added to the mining forces, and the number will be largely increased. It is said that already the railroads are realizing a large increase in the coal tonnage.

TENNESSEE

Jellico—The East Tennessee Coal Co., which a few months ago started a coal development at Lothair, in Perry County, Ky., announces that it will begin shipping coal Jan. 20. This new plant is one of the largest in the Perry County field. A connection with the Louisville & Nashville main line has just been completed, and put in operation. Several hundred men are being given employment.

Knoxville—The annual meeting of the Southern Appalachian Coal Operators' Association will probably be held on Feb. 2, according to announcement made here. At this meeting the election of officers will be the principal matter of business. Knoxville operators report that mines in this part of the state are under way again and that the recent cold weather greatly reduced the retail stocks on hand in this section. Business conditions are improving and the general tone of the market, it is said, is much better than it was 30 days ago.

KENTUCKY

Williamsburg—The Watts Creek Coal Co., operating mines at Woffard, Ky., north of here, has been sold to W. L. Moore, a local capitalist, for $4205. Mr. Moore will reorganize the company, which has been in the receiver's hands for some time and which was sold by the country commissioner, and expects to begin operating on the first of February.

Greenville—Charging that he was the victim of an unprovoked attack by employees of the Bevier Coal Co., and that he suffered 50 gunshot wounds in the side and back, Will Vance, himself under indictment for alleged participation in a "possum hunter" raid, has sued the coal company and a number of its employees for $5000 as damages. One of the defendants is J. P. Cox, who, as leader of a group of the company's employees, returned the fire of the raiders who attacked the company's store in which they were barricaded.

Frankfort—Some hope is expressed by interests which favored the Kentucky Workmen's Compensation law, that the Court of Appeals may reconsider its finding in that case. This hope is based only on the grant by the court of an additional 20 days in which the attorney general of the state may file his petition for a rehearing or modification of the court's opinion in the case. Three members of the court, one of them now chief justice, held in a dissenting opinion that the law was constitutional although the majority of the court ruled otherwise.

Harlan—The Haggin interests of Lexington and New York have bought a one-fourth interest in the Asher Coal Mining Co. of this section. The company's capital stock is $2,000,000 and the Haggin interests are reported to have paid $500,000 for their share. Judge T. J. Asher retains the remaining three-fourths. The company controls all the Asher land in Harlan and Bell counties, several thousand acres.

OHIO

Cleveland—Eastern Ohio coal operators, at a meeting recently held here, decided to open their mines under the open shop plan. Striking miners who have been idle since Apr. 1 last will have first opportunity under the scale offered by the operators. Notices that the mines in Belmont, Jefferson and Harrison counties will resume on a date to be selected later will be posted at virtually all of the operations in the eastern Ohio field. Should the strikers refuse the rate offered, they will be served with notices to vacate the coal companies' houses, failing in which eviction proceedings will be started.

Martins Ferry—Upon the settlement of the coal strike in eastern Ohio depends the opening of a mine in Jefferson county, which has been closed down for the past 7 years. This is the Royal Coal Co.'s mine located at Tarrs Run. It is stated that should the strike be settled, this mine would reopen immediately, giving employment to at least 400 men.

Carbon Hill—A new mine will be opened in the vicinity of Carbon Hill, Ohio, by interests from Nelsonville. It is planned to give employment to 50 men. Willis Ross and George Ridenhour are in charge of the project.

Marietta—A vein of coal has been opened on the William Covey farm located near the county infirmary of Washington County. The vein is 3½ ft. thick of good quality.

Columbus—The United States Supreme Court rendered a decision recently upholding the constitutionality of the Ohio workmen's compensation law. This measure was enacted several years ago and had been fought by certain interests. The decision upholds the right to classify employees with the provision that the operation of the law is to be limited to employers working more than five persons.

ILLINOIS

Marion—The axle or shaft on the top of the tipple, of the Big Muddy Fuel Co.'s mine, near here, recently broke squarely in two while the cages were midway between the bottom and the surface. Fortunately, no miners were in them, and when they went to the bottom no one was injured. The cables, in going down, tore away part of the upper portion of the tipple, necessitating a suspension of several days.

Danville—What is considered as remarkable among medical men is the case of Frank Partari, a coal miner, who suffered a broken back in a mine accident at the Carrier Mills, Saline County, more than a year ago, and who died on Jan. 2, at St. Elizabeth's Hospital here. He suffered absolutely no pain until the final week. This case attracted considerable attention in the medical world.

Harrisburg—Officials of the State Mine Rescue Commission have perfected plans for a rescue station here. This follows closely on the establishment of a relief or substation at Herrin.

Chicago—The Illinois Coal Operators' Association recently appointed a committee to consider methods of standardizing the sizes of bituminous coal to be mined and sold in the state. At the present time there are five sizes in common use. Operators in Indiana, Ohio, Pennsylvania, West Virginia and Kentucky have advocated the adoption of standard sizes for coal.

Willisville—The Willisville coal mines south of Sparta have reopened. These mines employ about 300 men and shutdown several weeks ago, when a race riot broke out and two Americans and two Italians were killed. In the reopening, both Americans and Italians got their old jobs back.

ARKANSAS

Russellville—Under a decree of the Chancery Court the property and lease of the Arkansas Anthracite Coal Mining Co. have been sold to satisfy a judgment for $16,500, rendered against the operators in favor of W. F. McBride, a miner who was injured while digging coal in the mines in March, 1913. The property was sold to the plaintiff who transferred his lease to the Southern Anthracite Coal Mining Co. which will operate the property for the remaining four years of the lease.

TEXAS

Albany—Announcement has been made of the discovery of a bed of coal 5 ft. thick on the ranch of S. Webb. 6 miles northeast of Albany. An oil well was being sunk on this land and at a depth of 675 ft. coal was encountered. Investigation showed the measure to be 5 ft. in thickness. Previous attempts to locate coal have resulted only in finding strata not more than 20 in. in thickness.

COLORADO

Denver—Fearing an attack by union miners on the jail at Walsenburg, Sheriff Farr, on Jan. 9, sent an urgent call for aid to Governor Ammons and a company of 70 militiamen in command at Captain Hill were placed on guard around the jail. There were about 15 strikers in jail charged with murder, conspiracy, and other crimes as the result of mine battles last spring. It has been predicted for some time that as soon as the Federal troops left the state trouble would start. The last of the regulars departed recently.

FOREIGN NEWS

Fernie, B. C.—One man was killed and two others severely injured as the result of a recent explosion occurring in the Coal Creek mine just before the men went down in the morning. Government Inspector of Mines Evans, who went below immediately after the explosion, was overcome by gas, as were his companions, Superintendent Caulfield, and Robert Adamson. Caulfield and Adamson were revived by the use of oxygen apparatus, but Inspector Evans failed to respond to this treatment and died in the afternoon. Two men who were near the entrance of the mine when the explosion occurred were badly injured, but aside from these no one was hurt.

PERSONALS

E. B. Lewis has been made traveling sales agent of the Philadelphia & Reading Coal & Iron Co., at Toledo. He formerly represented the company at South Bend, Indiana.

J. M. Roan, chief mine inspector of Ohio, is recovering from a severe illness, in Mt. Carmel Hospital, Columbus. Recently he returned from a trip in eastern Ohio and was threatened with diphtheria.

H. G. Davis, general superintendent of district No. 4, of the Delaware, Lackawanna & Western Coal Co., including all that territory in Wyoming Valley south of Kingston, on Jan. 6, tendered his annual banquet to all mine foremen of his district, and the event proved even a happier one than any heretofore given.

P. A. Coen has resigned his position as Northern sales agent for the Rail & River Coal Co., with offices in Toledo, to accept a position as general sales manager for the Sunday Creek Co., Columbus. Mr. Coen has already gone to Columbus to assume his new duties. He is widely acquainted with the coal business both in the mining and marketing departments. He has held many prominent positions throughout the country and was in charge of the Pittsburgh Coal Co.'s exhibit at the Louisiana Purchase Exposition in St. Louis.

PUBLICATIONS RECEIVED

Department of Public Works of the Province of Alberta, Annual Report for 1913. Two hundred and fifty-five pages, 6x9 in.; unillustrated.

Illinois Coal Mining Investigations, Bulletin No. 8; "Coal Mining Practice in District Six," by S. O. Andros; 49 pages, 6x9 in., illustrated.

Illinois State Geological Survey, Bulletin No. 28; "Oil and Gas in Bond, Macoupin and Montgomery Counties, Illinois"; by Raymond S. Blatchley; 51 pages, 7x10 in., illustrated.

The Oregon Bureau of Mines and Geology, "Petrology and Mineral Resources of Jackson and Josephine Counties," by A. N. Winchell. Two hundred and sixty-five pages, 6x9 in.; illustrated.

The University of Illinois, Engineering Experiment Station, Bulletin No. 76—"The Analysis of Coal with Phenol as a Solvent," by S. W. Parr and H. F. Hadley; 41 pages, 6x9 in., illustrated.

Department of the Interior, U. S. Geological Survey; "The Production of Natural Gas in 1913," prepared under the supervision of David T. Day, by B. Hill; 96 pages, 6x9 in., with many tables.

Department of the Interior, U. S. Geological Survey; "The Production of Petroleum in 1913," by David T. Day; 355 pages, 6x9 in., with numerous tables and an insert showing the petroleum production of various countries.

Department of the Interior, U. S. Geological Survey; "The 35th Annual Report of the Director of the U. S. Geological Survey to the Secretary of the Interior for the Fiscal Year, Ending June 30, 1914"; 163 pages, 6x9 in., with numerous tables.

Department of the Interior, Bureau of Mines, Bulletin No. 85; "Analysis of Mine and Car Samples of Coal Collected in the Fiscal Years 1911 to 1913," by Arno B. Fieldner, Howard I. Smith, Albert H. Fay, and Samuel Sanford; 444 pages, 6x9 in., with many tables.

TRADE CATALOGS

The Armstrong Cork & Insulation Co., Pittsburgh, Penn. "Nonpareil Insulating Brick for Boiler Settings." Fifteen pages, 3½x6 in., illustrated.

The Hitchcock Manufacturing Co., Pittsburgh, Penn. "Turnouts, Switches and Frogs." Fifteen pages, 6x9 in., with many illustrations, tables and other information.

CONSTRUCTION NEWS

Typo, Ky.—W. R. and C. P. Pense, of Philadelphia, Penn., have leased a coal boundary on First Creek and plan to begin development work immediately. It is said that an electrically equipped plant will be installed and that a daily output of 100 tons is planned for the beginning.

Floodwood, Ohio—Howard D. Manington, in charge of the construction of the power plant at Floodwood, Ohio, says the construction work has been delayed because of inability to secure materials promptly. The first turbine will be installed in January and it is expected that it will be making current by Feb. 1. Contracts have been made to supply the current to many mines in that section as well as to cities and towns. Athens, Nelsonville, Glouster, Albany, Buchtel and Murray City will be supplied with current.

Norton, Va.—The contract for the construction of the first post office building to contain provisions for a mine rescue station has just been awarded, and the structure will be erected immediately at Jellico, Tenn., in the mining region of that state. Another such post office building is under consideration for Norton. Norton is in the same general mining district, and not far from Jellico, but on the opposite side of the mountain range. It is the plan to equip both stations with mine rescue apparatus similar to that of numerous other stations already established in the mining regions,, From these points as headquarters relief can be sent quickly to the scenes of accident.

NEW INCORPORATIONS

Philippi, W. Va.—A. T. Thompson has incorporated with a capital stock of $100,000 to develop coal mines.

Cambridge, Ohio—The Coal Run Coal Co., of Cambridge, Ohio, has filed amended articles of incorporation increasing its capitalization from $5000 to $60,000.

Cincinnati, Ohio—Papers have been filed with the secretary of state increasing the authorized capital of the Reliance Coal & Coke Co., from $100,000 to $150,000.

Booneville, Ind.—The Boone Coal Co. has been organized with a capital of $15,000 to mine and sell coal. The directors are L. T. Shaw, C. E. Doane, William T. Shaw and others.

Charleston, W. Va.—Notice of an increase in capitalization from $500,000 to $1,000,000 was recently filed with the Secretary of State by the Main Island Creek Coal Co., of Logan County.

Wilburton, Okla.—The Wilburton Coal & Mining Co., of Wilburton, has been organized with a capital stock of $1000. The incorporators are James T. Katigan, Annie Katigan, of Wilburton, and John Campbell, of Ritchie, Mo.

Charleston, W. Va.—The Imperial Coal Sales Co., of Burnwell, in Kanawha County, was recently granted incorporation papers. This company is capitalized at $5000, and the incorporators are Quinn Morton, of Brunwell, W. S. Wood, Geo. S. Couch, Jr., S. B. Richmond and Charles Rumbaugh, all of Charleston.

INDUSTRIAL NEWS

Dayton, Tenn.—It is believed that the present mine inspectors, of Tennessee will not go out of office before the first of June unless the fever of "turn the rascals out" gets extremely high. It is not thought probable that this will be the case.

Wellsville, N. Y.—The New York office of the Kerr Turbine Co. will henceforward be in charge of Benjamin G. Fernald, recently appointed district manager. The office will remain in the Singer Bldg., but will be removed to Room 108 in the annex, or No. 45 Liberty St.

Pittsburgh, Penn.—From all parts of Pennsylvania come encouraging reports of renewed industrial activity, of men returning to work, and renewed confidence on the part of capital. This is to be noted especially in the steel and coal industries, two vital branches in the state's business.

Boston, Mass.—All the floating equipment of the Consolidation Coal Co. has been taken over by the Consolidation Coastwise Co. of Massachusetts. It was decided some time ago to divorce this department from the coal company, and the new concern was formed with the parent concern the principal stockholder.

Huntington, W. Va.—Figures recently given out by the Chesapeake & Ohio R.R. show that the coal and coke loadings in West Virginia and Kentucky coal fields increased 188.2% in the last ten years. Loadings for 1914 were 22,431,445 tons or an increase of 16.9% over the previous season. It is believed that 1915 loadings will exceed these figures.

Pittsburgh, Penn.—Reports are current that negotiations have been practically completed between J. V. Thompson, of Uniontown, and interests believed to represent the United States Steel Corporation, for the sale of the major portion of 200,000 acres of coal land in Greene County, Penn. It is variously estimated that the transaction involves from 18 to 34 million dollars.

Pittsburgh, Penn.—Ten towboats were started south with coal on the Ohio River Jan. 10, the total shipment aggregating about 2,000,000 bu., or in round numbers 80,000 tons. This shipment about cleaned up the anchorages of coal in the local harbor, much of which had been tied up since the middle of last summer. Some of the towboats will turn back after getting below Wheeling.

Pittsburgh, Penn.—The total shipments of coal for 1914 from the Monongahela River mines passing through Lock No. 4 were 170,278,500 bu., or a decrease of 39,998,500 bu. from the total shipments for 1913. This decrease in shipments during the past year is attributed to low water preventing the return of boats from Southern ports in sufficient quantities to keep the mines in operation.

Morgantown, W. Va.—It has been announced by J. B. Hanford, of the Elkins Coal & Coke Co., that his firm has just closed a contract of 20 years' duration to furnish the Lehigh Coal Co., of South Bethlehem, Penn., 600,000 tons of coal annually. This contract is one of the largest ever handled by the company, and means that all the mines in this section will run on full time for years to come.

Boston, Mass.—The Darrow - Mann Co., an old house here and latterly the local factor for the Caperton interests in the New River field, has been absorbed by the New England Coal & Coke Co. The larger company will be sales agent for the same coals handled by the Darrow-Mann Co., and will also operate the sea-going tugs and the larger barges that have belonged to the Commercial Tow Boat Co., a concern that was closely allied with the Darrow-Mann Co.

Columbus, Ohio—No bids were received by receiver Charles Cohenour, of the Maple-Gallia Coal Co. when the property of the defunct firm was offered for sale at the Court House, Columbus, Jan. 9. The property, which consists of two mines in Athens and Vinton counties, was appraised at more than $36,000. The capacity is about 800 tons daily. Negotiations are now pending to sell the property at private sale and the court will be asked for instructions.

Columbus, Ohio—Of interest to the coal interests of Ohio is the announcement that all of the operating offices of the Toledo & Ohio Central, the Kanawha & Michigan and the Zanesville & Western railroads will be consolidated in Columbus. Frederick B. Sheldon, former president of the Kanawha & Michigan, has been made vice-president of the Toledo & Ohio Central and the Zanesville & Western, which are subsidiary lines to the New York Central system. The general and operating offices of the companies have in the past been located in Toledo but the lease on the offices expires in May.

Philadelphia, Penn.—The official decision of the Public Service Commission ordering a reduction of anthracite freight rates from the Pennsylvania regions to this city gives the companies until Jan. 18, or six days longer than was originally expected, in which to apply for a rehearing before the commission or make a direct appeal to the Dauphin County Court. The original tentative announcement made in the anthracite rate case bore the date of Dec. 12, 1914, and therefore it was believed to take effect Jan. 12. Copies of the final decision, however, which have been sent out by the commission within the last few days bear the date of Dec. 18.

Somerset, Penn.—According to Baltimore & Ohio railroad men there is no longer any reason to doubt that there is a genuine boom in the coal business. Many of the mines in Somerset County, which have not been operating above nominal repair work for months, are now on full time and considering the advisability of putting on extra shifts to keep up with their orders. The Somerset transfer yards for the past week have been jammed with loaded coal cars going out and with empties coming in. The coal is going east to Tidewater, west to the Mississippi and north to Canada. Some of the orders are said to be for European fleets.

Coal Trade Reviews

General Review

Anthracite under heavy pressure with operations rigidly curtailed. Bituminous steady and showing occasional gains. Stocks reduced by the holiday curtailment. Urgent business in the Middle West.

Anthracite mining has slowed up appreciably under the influence of the milder weather, and the trade is distinctly flat, with a marked tendency toward heaviness. Most of the large companies are cutting down running schedules, and those continuing on a full-time basis are only doing so in order to accumulate a surplus against some possibly severe weather and a consequent slow movement. The market is entirely lacking the customary midwinter snap.

The Eastern bituminous agencies report a very slight improvement, which is due to a restriction in operations rather than any increased demand. The surplus tonnages at Tidewater seem to be substantially reduced as a result of the curtailed output over the holiday period, and there is no pressure to move demurrage coal. Even though this change for the better be scarcely perceptible, sales agencies are showing a greater confidence in preliminary negotiations on new contracts, while spot prices are slightly firmer. It is highly probably that the abnormal vessel rates will cause such an irregular movement in the Coastwise trade that the market may be subject to more or less violent fluctuations.

The marked improvement noted in the Middle Western field for the past several weeks has reached to the Pittsburgh district, where the industrial demand is decidedly better, though still substantially below normal. There has been considerable coal taken off the spot market, while operations are slightly heavier and show indications of a sharp increase. While nothing in the nature of a boom is anticipated, it is thought in all quarters that there will be a gradual and strong improvement along conservative lines from now on.

The improvement in Ohio is confined more particularly to railroad buying, and has not attained to large proportions. In domestic circles the approach of spring is already becoming a feature in the situation, and dealers are showing a tendency to be more conservative regarding their purchases in order to avoid the possibility of carrying over any large surpluses. What few contracts have come up have been closed at last year's figures. The Southern market is obviously overstocked and has failed utterly to respond to the improved conditions noted in other directions. Domestic consumers are not buying to the extent anticipated, and dealers are restricting their orders to the minimum.

With the exception of occasional spots where the effects of the warmer weather are being felt, the Middle Western market continues to broaden out in a most satisfactory manner. Numerous orders have been placed for rush shipments, while certain sizes have shown an unexpected strength, and price advances have met with no resistance, but apparently created a heavier buying movement. The railroads seem to be coming into the market stronger, and spot prices are in some instances higher than contract quotations for the first time in a long period.

ATLANTIC SEABOARD

BOSTON

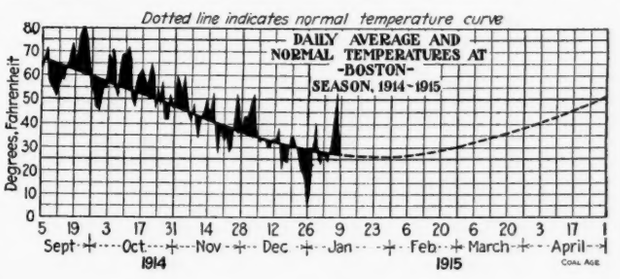
Improvement continues but very slowly. The mild spell slows up the buying and prices on Pocahontas and New River are practically without change. Receipts here still light on account of slow movement of transportation.

Bituminous—While there is undoubtedly an improvement in the situation on Hampton Roads coals, the progress is very slow. It is the restriction of output, however, and not an enlarged market that causes the improvement. The expected renewal of inquiry off-shore has not at yet developed into any proportions and it is still a hand-to-mouth market in New England. Contract demand is generally better because of recent interruptions to shipping. Preliminary talk on contracts the coming season shows more confidence on the part of the sales agencies than a month ago; current views of the probable state of prices are a notch higher than was the case then.

The spot market, on the other hand, is very little firmer than in November and December; $2.70 is about the upset price for the favorably known grades .o.b. the Virginia terminals, the price at which the Panama Railroad contract was awarded. This is a season when sales of cargo lots are very infrequent in this territory but all the shippers are pressing for orders and the feeling is general that prices would be made to suit the buyer who happened to be in the market. The number of such, however, is very small.

The surplus of coal at all the distributing points is rather less than has lately been the rule. "Market cargoes" are less frequent and prices more even; $3.68 is still the minimum price f.o.b. Boston but with trade rather slow.

Georges Creek demand is still constant, the shippers being well supplied with business. In order to get forward coal in



sufficient volume a number of sailing vessels and outside barges were chartered to make up for light receipts due to bad weather along the coast a fortnight ago.

The choicer Pennsylvania coals enjoy a fair business on the basis of restricted output but the ordinary grades are rather druggy. There seems nothing better in sight until Hampton Roads shippers get higher prices.

Anthracite—Orders are beginning to come in freely now to most of the wholesalers. Retail trade is good in all directions. All sizes are in good supply and the only delay in loading has been due to weather interruption in the movement of boats.

Prices on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*.....	$0.90@1.50	$1.15@1.65	$1.67@1.77	
Philadelphia*.....	2.15@2.75	2.40@2.90	2.92@3.02	
New York*.....	2.45@3.00	2.70@3.20	3.22@3.32	
Baltimore*.....	.....	.....	2.85@2.95	
Hampton Roads*.	.....	.....	.....	$2.60@2.75
Boston†.....	.....	.....	.....	3.68@3.78
Providence†.....	.....	.....	.....	3.63@3.73

* F.o.b. †On cars.

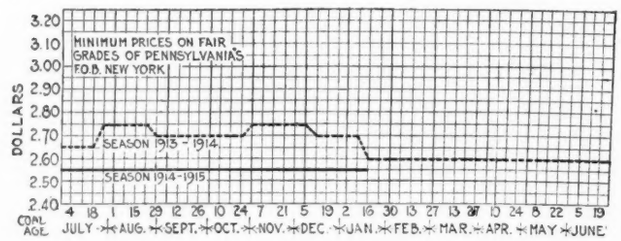
NEW YORK

Bituminous still marking time though stocks are somewhat reduced as a result of the curtailed operations over the holidays. Heavy reduction in working schedules the feature of the anthracite trade.

Bituminous—As a result of the curtailed operations in the bituminous fields over the holidays, stocks are somewhat lighter and the operators continue cheerful over the outlook. Some operators report the December tonnage as the best they have had for a long time, one large company in particular claiming it to be their heaviest month since March. Current operations also seem to be slightly increased. Occasional odd tonnages are still heard of on demurrage, but there is no general pressure on consignment coal.

The continued advance in vessel rates is creating much interest in the trade. If the situation becomes much tighter in this respect, the difficulty in obtaining vessel tonnage will make the movement irregular and must inevitably result in a fluctuating market. There is nothing much of interest developed so far, on new contracts, but the outlook is not at present regarded as favorable. At no time since last April has the spot market been at a higher level than contract figures, and it is clear that buyers will be conservative about new contracts. Any advances are, of course, not being considered, but, on the other hand, the agencies will make a determined fight for the same prices as last year, though concessions will no doubt be necessary.

The New York market is quotable on the same basis as follows: West Virginia steam, $2.35@2.55; fair grades, Pennsylvania, $2.55@2.65; good grades of Pennsylvania, $2.70@2.80; best Miller Pennsylvania, $3.10@3.15; Georges Creek, $3.15@3.25.


MINIMUM PRICES ON FAIR GRADES OF PENNSYLVANIAS F.O.B. NEW YORK
DOLLARS
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
SEASON 1913 - 1914
SEASON 1914-1915
4 18 1 15 29 12 26 10 24 7 21 5 19 2 16 30 13 27 13 27 10 24 8 22 5 19
COAL AGE
JULY AUG. SEPT. OCT. NOV. DEC JAN. FEB. MAR. APR. MAY JUNE

Anthracite—The return of more moderate temperatures has caused a slowing up in the hard-coal trade. At this time the market is more or less controlled by weather conditions, and prices fluctuate accordingly. The situation was so slow last week, that the Reading Co. reduced operations to only three days, other companies curtailing likewise, though not to such an extent. A few of the companies are producing in excess of the market requirements in anticipation of a heavier demand and slower movement should the weather become severe as is liable to be the case at this time.

The steam sizes are in fairly good demand, especially the higher grades, while pea coal is rather short. Chestnut is in good demand, with shipments slow in the line trade, but prompt at Tidewater where the companies are drawing on their storage supplies. There is not much individual nut coal in evidence. Stove coal is bringing the full circular, and the demand and supply are about equally balanced.

The New York hard-coal market is now quotable on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	$5.10	$4.60@5.10	$5.05	$4.55@5.05
Egg	5.35	5.00@5.35	5.30	4.80@5.30
Stove	5.35	5.25@5.35	5 30	5.20@5.30
Chestnut	5.60	5.45@5.60	5.55	5.40@5.55
Pea	3.55	3.45@3.55	3.50	3.35@3.50
Buckwheat	2.80	2.50@2.80	2.50@2.75	2.15@2.75
Rice	2.30	2.20@2.30	2.00@2.25	1.35@2.25
Barley	1.80	1.60@1.80	1.75	1.25@1.75

PHILADELPHIA

Anthracite trade continues to lack tone. Curtailed operations still effective. All sizes in easy supply. No immediate improvement noted in bituminous, although prospects look better.

Anthracite—The unseasonable weather of the past week has proved a further drawback to the anthracite trade. It was confidently expected that the beginning of the new year would see good business, but the weather has been against this, and partial operations at the mines have been the rule rather than the exception. Judicious distribution of the output has been necessary in order not to crowd any one point with a surplus and even with this, it is understood that considerable coal is nearly on demurrage at Tidewater. All sizes are in good supply. The market is still slow on broken, and it is understood the reduction of this to smaller sizes has been necessary, in order to provide a disposal for it. Egg is also long. There appears to be a slightly better call for pea and buckwheat; in fact, it is understood that stocks are being drawn on for the latter. The requisitions for rice are about equal to the output.

The trade as a whole requires the stimulus of cold weather, and without this, is likely to drag.

Prices at Tidewater rule about as follows:

	Circular	Individuals
Broken	$4.75	$4.50
Egg	5.00	4.75
Stove	5.00	5.00
Chestnut	5.25	5.00@5.10

BALTIMORE

Anthracite demand quite brisk, and dealers experience a general activity. Slow betterment evident in the bituminous trade. Export movement only medium, and subject to delays.

The December consumption of anthracite was quite heavy, and January is seeing a vigorous call from many quarters. The small trade is particularly bright. In the soft-coal trade there is a slow betterment, but the general business world remains cautious. The producers now have their mines generally down to a much reduced basis, and the return to full capacity operations will only be done when business of a favorable nature develops.

Spot business generally is about fair. Some of the better Pennsylvania coals showed up a little stronger the past week, sales to the trade at the mines being made around $1.35. Lower grades ranged from 95c. to $1.10 or $1.15. In West Virginia the demand remains poor for gas three-quarter with the price around 90c. The export movement continues about medium. A few charters are being announced, principally to Cuban ports. The fact that the allied navies continue to stop many vessels at sea has caused several delays in the reporting of steamers destined for the foreign coal trade.

HAMPTON ROADS

Movement for week fair. Government taking coal by colliers and barge schooners going into the export trade.

The movement from Tidewater for the week was about the average. Some large cargoes have moved to New England and there has been some coal taken by the government. The export and bunker movements have not been so heavy as at times during last month; however, the dumpings for the first ten days of the month they will run considerably in excess of those for the same time during December.

Prices remain at circular with a poor demand for spot coal. The accumulation at Tidewater is somewhat lower than it has been for some weeks, although there is ample on hand to take care of any call that may be made.

A number of the coastwise steamers which have been trading from Hampton Roads are now in the foreign trade and barges and sailing vessels are taking their places in the coastwise business. Schooners are also being pressed into the export coal trade, two of them having been loaded during the week, one for Porto Rico and another for Rio de Janeiro.

OCEAN CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Edward H. Cole		Norfolk	Rio Janeiro	1395	$5.25
Kenwood		Baltimore	Cienfuegos	797	
Blackheath	British	Baltimore	Alexandria	2978	7.40
Ubbergen	Dutch	Baltimore	Preston and Banes	1150	
Thomas F. Pollard		Baltimore	Texas City	617	1.15
Hugh Kelly		Baltimore	Texas City	698	
Josephine		Baltimore	Galveston	842	
Angiolina	Italian	Baltimore	Italy	2262	

Note—Steamers are indicated by **bold face** type, all others being schooners.

OCEAN FREIGHTS

Rates continue at previous high levels and there are no indications of any immediate relief.

A steamer was chartered during the past week for case oil, from here to Brazil, at equivalent to $9.60 on coal, and steamers are now offering for coal, from north of Hatteras to Buenos Aires or Rio at $9, and intimating that they will accept less. A large steamer was recently chartered for coals to Alexandria at $10.80 and steamers are offered at $9.60 to the West Coast of Italy. Freight market conditions are practically the same as a week ago. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana*	$2.00	Guantanamo	$2.50@2.75
Cardenas or Sagua*	2.50	Demerara*	4.50
Cienfuegos*	2.50	Bermuda	2.40@2.50
Port of Spain, Trinidad	2.75@3.00	Vera Cruz*	2.50
St. Lucia	2.50@3.00	Tampico*	2.50
St. Thomas*	2.50	Rio*	8.40
Barbados	2.75@3.00	Montevideo, Buenos Aires or La Plata*	7.20@8.40
Kingston*†	2.50	Mediterranean	9.60
Curacao	2.25@2.50		
Santiago	2.50@2.75		

*About. †Small boats to Kingston $2.50@2.75. W. W. Battie & Co.'s Coal Trade Freight Report.

BUFFALO

Slow improvement in bituminous, but trade is very hopeful. Manufacturers increasing operations. Anthracite continues rather dull.

Bituminous—There is a slow but steady improvement all along the line, which is expected to continue, but is not likely to develop into a boom. Shippers say that they get a good day or two occasionally, which is the usual way that an increasing trade manifests itself. At this rate prices will advance slowly, but there is some profit now and the increased volume will help materially.

The feeling in railroad circles is good and there is more buying from that source than for a long time. As a rule railroad men state that they are expecting a good year, and if they do it will help the coal business.

The coal movement is steady. Nobody complains of demurrage charges and the snow and severe weather have not in any way interrupted deliveries. If there is no new disturbance in the situation there will be a good volume of business doing in a month or two. The market is a little stronger week by week, on the former basis of $2.80 for best Pittsburgh lump, $2.70 for three-quarter, $2.55 for mine-run and $2.15 for slack. Allegheny Valley sizes are 25c. lower than Pittsburgh, with slack on a par with it.

Anthracite—The market is good at retail but shippers do not find it as active as formerly, though it is reported that sales from the Upper-Lake docks are good. The influence of the heavy summer sales is still felt and this may last all winter. The weather is not as cold as formerly, but the consumption to date has been decidedly greater than in any former winter for a long time. The disappearance of most of the snow has left the streets an almost solid sheet of ice, making it almost impossible to deliver anything with horses, but the automobile truck moves as readily as usual.

Loading cargoes for winter storage in the harbor has ceased for the time. There are ten large cargoes in the winter list, but the supply of coal to be handled in that way is short. It is likely that the trestles will again become active before spring, as it is desirable to put a good amount afloat in order to begin the shipping season as usual with a strong movement.

OHIO VALLEY

PITTSBURGH

Some new demand and increased requirements against contracts. Mines working at over 50% of capacity. Prices less irregular.

The demand for coal has continued to improve. For domestic purposes there is somewhat better call, while for industrial uses the demand is very decidedly improved, though it is still far below the average or normal. The increased industrial requirements do not reflect directly in the market for the reason that they apply almost wholly to shipments under regular contracts, but by giving the mining companies better shipments they decrease somewhat the insistence with which free coal is offered in the spot market. This week the coal mines of the Pittsburgh district are operating at 50% of capacity or more, and prospects are that there will be a further increase. There is now no question that the low point in operations was passed a few weeks ago, when the rate was less than 40%.

There has been a limited amount of contracting for the calendar year, in connection with inquiries that have been coming out as noted in the last report, but not a great deal, since the bulk of the contract tonnage runs to Apr. 1. The market for slack shows still more firmness, and many producers are holding out for $1 on prompt lots, though contracts are made at 90c. when running over the twelvemonth, and sometimes at a shade less. In mine-run and screened coal there is less irregularity and the market now has a semblance of steadiness on the basis of $1.15 for mine-run, the usual asking price on contracts being $1.20. We quote prompt coal as follows: Slack, 90c.@$1; nut and slack, $1.05; nut, $1.10; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

TOLEDO

Toledo a weather market. Ohio operators to open mines under open-shop policy. Many leaving the state altogether.

The local coal situation remains practically unchanged. Conditions are regulated almost entirely by the weather, which has not been wholly favorable. There has been a change in prices and some weakness is being shown in certain grades. Fine coal is a trifle stronger, but this is due to the fact that slow production is bringing about a shortage in these grades. Coal men here are optimistic and point to the improvement among the railroads since the rate increase as indicating that business is bound to be better a little later on. Local dealers will not be particularly affected by the mining situation in Ohio. Those operators who have not concluded to leave the state altogether are going to reopen their mines under the open-shop policy.

COLUMBUS

Steady business is reported in domestic lines. Prices are generally well maintained and a better feeling is evident in most localities. The steam business still slow. Production light.

The coal trade in Ohio has been progressing steadily during the past week. Domestic trade is fair and orders are coming in better. Slowness still characterizes the steam trade. The tone of the market is a little better and most of the coal men are united in saying that future prospects are brighter.

Domestic sizes are about holding their own in the local trade. Dealers' stocks ran down to a pretty low point during the holiday and inventory periods and as a result the demand is better. There is a fairly good demand for West Virginia splints and Pocahontas. Anthracite is also moving fairly well. Retail prices are steady at the levels which have prevailed for several weeks.

Production has not increased materially although more steadiness is reported in most fields. The Hocking Valley produced about 65% of the usual amount and the same in the Crooksville, Jackson and Cambridge districts. The Pomeroy Bend field is producing about 80% of the average.

Strength is still shown in the small sizes. This is due to the continued low production of lump and the closing of the Lake trade. Nut, pea and slack is sold at 60 to 70c. and coarse slack is about 10c. less.

Prices in the Ohio fields are:

	Hocking Valley	Pomeroy	Kanawha
Rescreened lump	$1.50	$1.60	.....
Inch and a quarter	1.45	1.50	$1.45
Three-quarter inch	1.35	1.40	1.35
Nut	1.15	1.25	1.15
Mine-run	1.10	1.15	1.10
Nut, pea and slack	0.65	0.75	0.60
Coarse slack	0.55	0.65	0.50

CLEVELAND

Warm weather and a large amount of coal have kept the market heavy. Consignment coal coming in and having an adverse effect.

Fine coals are being sold at $1.70 to $1.75 with a more liberal supply than is necessary for the demand. Brokers and operators are putting as much coal in on contracts as the consumers can stand. This has had a bracing effect, but the cost of the coal is so near the selling price there is no chance to cut quotations.

Some three-quarter West Virginia No. 8 is coming into the market on consignment and prices range as low as $1.95 on track here with $2.05 the top. There is little demand for coarse coal anywhere. The warm weather has reduced the retail demand and the trade has not had to buy more than a car or two to keep stocks up.

CINCINNATI

Slower buying due to usual slowing up at the beginning of the new year. General conditions fair and improvement is considered certain.

Business has been rather dull, due to the usual new year slowing up. The weather has been all that could be asked by the trade, but buying has been in relatively small volume. On domestic coal this seems to be due to the lateness of the season.

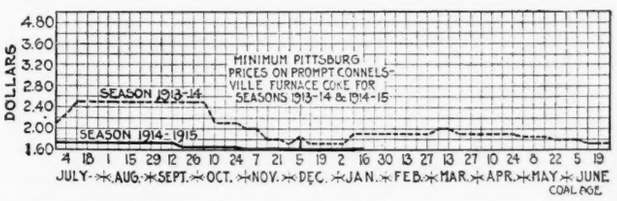
As heretofore reported, stocks were heavily drawn upon during the severe weather of December, but now that a new year has begun, most of the retail trade seems to be determined not to stock any considerable supply. The remarkably good transportation conditions have been a real handicap to business, as it has been possible at all times for retailers to secure supplies immediately on demand. If this were not the case stocking would undoubtedly be more liberal. Prices have been maintained at a fair level, as a rule, save in the comparatively few cases where distress coal has been thrown on the market.

COKE

CONNELLSVILLE

Coke market stagnant, contracts being closed and further activity awaiting the blowing in of additional blast furnaces. Production and shipments slightly decreased.

The coke market is decidedly quiet, as it has been since the contracting movement slowed up just before the holidays. Here and there negotiations have been in progress on small lots for various periods, but in general the market is stagnant, awaiting a fresh demand through the blowing in of additional blast furnaces. Of this there is no immediate prospect. Iron


DOLLARS
4.80
3.60
3.20
2.80
2.40
2.00
1.60
MINIMUM PITTSBURG PRICES ON PROMPT CONNELSVILLE FURNACE COKE FOR SEASONS 1913-14 & 1914-15
SEASON 1913-14
SEASON 1914-1915
4 18 1 15 29 12 26 10 24 7 21 5 19 2 16 30 13 27 13 27 10 24 8 22 5 19
JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE
COAL AGE

and steel conditions have improved but it appears that there was an excess of production when demand for iron and steel was at its lowest. There have been occasional purchases of prompt furnace coke, and a little prompt foundry coke is moving all the time. The market is quotable as follows: prompt furnace, $1.60; contract furnace, $1.75; prompt foundry, $2@2.20; contract foundry, $2.15@2.25, per net ton at ovens.

The "Courier" reports production in the Connellsville and

lower Connellsville region in the week ended Jan. 2 at 202,497 tons, a decrease of 5633 tons, and shipments at 201,712 tons, a decrease of 5568 tons.

BUFFALO

Coke is moving much as before, with prices still at the bottom. This is not much confirmation of the general belief that business is better and will resume its old activity. There are reports of iron orders given and furnaces running stronger, but they can hardly do a much increased business till there is more demand for coke. Prices continue to rule quiet on the basis of $4.25 for best 72-hr. Connellsville foundry and $3.30 for stock coke.

CLEVELAND

For several weeks coke has been low and the demand small, but the trade is taking it in much larger quantities than heretofore, and the prices are firmer than they have been. This fuel goes to foundries and the trade that is supplied by foundries is a good criterion of the business improvement.

COLUMBUS

There is a better demand for coke in Columbus and central Ohio territory. Shipments are coming in regularly from Pennsylvania.

CHICAGO

Increased inquiries are noted for furnace and foundry coke to be taken under contracts for the first-half of the year. Very few contracts have been executed, and the presumption is that producers do not wish to commit themselves at this time. Prices are as follows: Byproduct, $4.75@5; Connellsville, $4.75@4.90; Wise County 72-hr. (select), $4.75; gas coke, $4.25@4.35.

THE STEEL INDUSTRY

Situation unchanged though operations are very slightly increased. Rail purchases continue light.

Steel works are increasing slightly their rate of operations and for this week a number of large companies are running at 40 to 50% capacity. The Steel Corporation's percentage is 45 and it may be able to increase this shortly to 50, as specifications are rather better.

Taking the trade through, the first half of January has brought no new turn. The railroads naturally require some time to canvass and finance their needs and have so indicated in response to intimations that early and very considerable buying was now expected from them.

It is not decided how much of the 150,000 tons the Pennsylvania Railroad has definitely decided to buy will be given out this month. The New York Central has placed a part of the 40,000 tons on which it asked prices on Jan. 4. The New Haven is to buy 18,000 tons and the Boston & Maine 15,000 tons. Western roads have given little sign of their probable wants. —"The Iron Age."

SOUTHERN

LOUISVILLE

Market continues heavy in spite of the optimistic reports from all quarters. Dealers carrying full stocks.

In spite of reports from the mining sections to the effect that the mines are getting under way again, the Kentucky coal trade is mostly in a pessimistic frame of mind. Steam coals are undoubtedly in better demand, but there is almost no call for domestic sizes notwithstanding the fact that December was unusually cold. This means that the production of steam coals is more costly.

Though some operators are selling for such prices as they can get, quotations generally on block coals are from $1.50 up; egg coals are hardly salable at even $1, while nut and slack ranges from 35 to 75c., according to grade, all prices f.o.b. mines.

MIDDLE WESTERN

CHICAGO

Activity characterizes general market. Normal winter weather maintains prices. Demand for Western coals brisk. Good undertone in Eastern coals and anthracite strong.

Increasing strength is noted in the local market, and a tendency toward development of trade on a broadening scale. The continued cold weather has been a considerable factor toward further improvement. There has been a better demand for domestic coal and steam sizes with prices well maintained. It was thought that the holiday period would see the usual slackening up of orders but it was quite the reverse. Chicago yards have had a busy week, and have placed numerous orders with the operators for rush shipments.

Unabated activity continues in screenings although if the demand for domestic coals presists it is not unlikely that the fine grades will soften before long. Some of the best informed agencies believe that screenings will see a general reduction of from 10c. to 15c. per ton before the end of January.

The cold weather has served to increase orders for Franklin County domestic sizes, which have shown great strength. The increased circular prices from this district have apparently only resulted in a heavier demand. A number of shipments of domestic lump have been made at $2 and screenings are still firm at around 85 cents.

Circular prices are strongly adhered to in the Springfield district. While the demand for screenings from this section has slowed down slightly, the price has not declined.

One producing company in the Carterville field has held domestic lump firm at $2, and made no shipments under that figure during the past week.

Considerable eastern Kentucky coal has been sold in this market recently at full circular prices, and the tone is strong.

Hocking grades have been doing fairly well, although several shipments of consignment coal have been sold at comparatively low levels.

Smokeless is fairly steady. There has been some price cutting by Chicago retailers, but this is not of much consequence.

The situation in anthracite is practically unchanged from last week; the market is neither strong nor weak. Chestnut is short, and egg and stove shipments about equal the demand.

Prevailing quotations are as follows:

	Franklin Co.	Springfield	Sullivan	Clinton	Carterville
Lump.....	$1.75@2.00	$1.50	$1.75	$1.50@1.65	$1.75@2.00
4-in. lump..	....	....	....	....	....
Steam lump	....	1.15	....	1.20	....
2½-in. lump.	....	....	1.60	....	....
1¼-in. lump.	....	....	1.35@1.50	....	....
Mine-run...	1.25	1.10	....	1.10	....
Egg.....	1.75@1.85	....	....	1.40@1.50	....
No.1washed	....	....	....	....	1.75@1.85
No.2washed	....	....	....	....	1.60@1.75
6x3-in. egg.	....	1.50	....	....	1.75
Nut.....	....	1.35	....	1.25	....
No. 1 nut..	1.85	....	....	....	....
No. 2 nut..	1.60	....	....	....	....
Screenings..	0.85@0.90	0.75	0.75@0.85	0.75@0.85	....

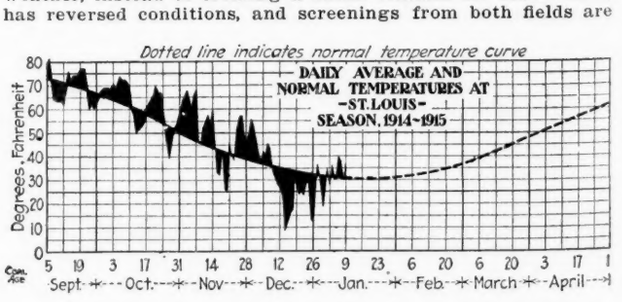
	Harrisburg	E. Kentucky	N. Riv. & Poca.	Somerset	Hocking
Lump.....	$1.75	$1.75@1.90	....	....	....
1¼-in. lump.	....	....	....	....	$1.50@1.60
Lump & egg	....	....	$2.00@2.25	$2.25	....
Mine-run...	1.20	....	1.25@1.40	1.25@1.40	1.15@1.25
Egg.....	1.60@1.75	1.50@1.75	....	....	....
No. 1 nut..	1.75	....	....	....	....
No. 2 nut..	1.40@1.60	....	....	....	....
Screenings..	0.85	....	....	....	....

Greene County 5-in. lump, $1.50@1.65; 3-in. lump, $1.30@1.40; 5-in. egg, $1.25@1.35; 3-in. egg, $1.30; mine-run, $1.10; screenings 80 cents.

ST. LOUIS

Warmer weather has caused the market to slow up again. Situation steady and will improve rapidly with lower temperatures.

The local situation is not as encouraging, as the market has been somewhat heavy and dull on everything. Warmer weather, instead of creating a better demand for steam sizes, has reversed conditions, and screenings from both fields are



weakening. Washed coals from the Carterville field are in good demand; as a matter of fact, these are the only sizes that are keeping up in price. But indications are good for cold weather and there is every reason to believe that with the next touch of winter the market will be in a healthy condition.

In the Standard field there is no change to speak of, with the possible exception that some grades of Standard lump have been occasionally offered as low as 90c. With this condition existing, screenings dropped from 50 to 60c., with a promise of going to 45 or as low as 40c. Colder weather is the only hope for the Standard field right now.

Anthracite coal is not as strong as at the first of the year. There is very little demand at all for smokeless.

The prevailing prices are:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump	.....	....	$1.25	$0.95@1.05	$1.05@1.10
3-in. lump	.....	....	1.40	....	.....
6-in. lump	$1.35@1.65	....	1.50	1.20@1.30	1.20@1.30
Lump and egg	1.85@2.15	$2.00	.....	....	1.35
No. 1 nut	1.15@1.35	....	.....	0.90@0.95	.....
Screenings	0.50@0.55	....	.....	0.55@0.65	0.55@0.60
Mine-run	0.95@1.05	....	.....	0.85@0.90	.....
No. 1 washed nut	1.65@1.75	....	1.60	....	.....
No. 2 washed nut	1.35@1.40	....	....	....	.....
No. 3 washed nut	1.10@1.15	....	.....	....	.....
No. 4 washed nut	1.05@1.10	....	.....	....	.....
No. 5 washed nut	0.75@0 80	....	.....	....	.....

PORTLAND, ORE.

Milder weather again prevails and the demand is less.

The first shipment of blacksmith coal by way of the Panama Canal was made here a few days ago when the steamer "John T. Scott" arrived from Baltimore with 500 tons consigned to the Pacific Coast Coal Co. The steamer also took a shipment of coal to Seattle. A shipment of some 500 tons of anthracite from Philadelphia is due to arrive in a few days on the steamer "Cricket," which is now en route. It is said that this coal will be retailed for about $14 per ton.

FOREIGN MARKETS

GREAT BRITAIN

Shortage of supplies and prices irregular. Government cuts insurance rate.

Jan. 1—The London coal trade is largely affected by the holiday influence still, but the orders have come in freely during the week. Considerable disappointment is felt at the nonarrival of supplies. Some depots are absolutely clear of stock coal and the shortage is becoming serious. Colliery prices are irregular. Official lists are largely withdrawn.

The past week has brought forth further proof that, given adequate tonnage at reasonable rates, business could not be other than distinctly healthy. As was only to be expected, a holiday tone dominated the markets, and actual transactions were accordingly of a small character. The difficulty of obtaining supplies owing to the scarcity of wagons has developed into serious dimensions.

The United States Government has presented a protest to Great Britain, complaining of the treatment of American shipping by the British navy.

The Government rate of insurance of cargo against war risks has been reduced from 1½ guineas to 1 guinea per cent. "The Colliery Guardian."

Coal Contracts Pending

Contracts listed in this department are authoritative in every respect except where the source of information is questionable, in which event it is noted. All contracts are listed promptly on receipt and only repeated when additional information becomes available or in the last issue previous to the day on which bids will be closed. Liberal remuneration will be paid for all legitimate notices of this kind sent in.

Contract No. 41—New York—The bids on this contract (p. 108), which provides for furnishing and delivering anthracite broken coal to the Brooklyn Bridge, were as follows: John F. Schmadeke, $3282; Charles D. Norton Co., $3342; Sterns Bros., $3504. Address Department of Bridges, Municipal Building, Manhattan.

Contract No. 46—New York—Sealed bids will be received by the Board of Health until 10:30 a.m., Jan. 22, for furnishing and delivering white ash anthracite coal, as required, to the various office buildings, clinics, hospitals, day camps and disinfecting stations of the Department of Health, in the different Boroughs of New York, and the tuberculosis sanatarium at Otisville, Orange County, New York. No bond will be required with the bid, but upon awarding the contract, a bond of 30% of the amount of the contract will be required. Deliveries are to be made between Jan. 1 and June 30. Blank forms and further information may be had at the office of the Chief Clerk, Department of Health, Centre and Walker Sts., Manhattan. S. S. Goldwater, M. D., is president of the board.

Contract No. 47—Batesville, Ark.—The Municipal Electric Light & Water Plant of Batesville will be in the market for 1800 tons of mine-run coal on Feb. 1. The approximate price is $3.35 per ton, and the coal is bought on a competitive basis, the usual test being the cost of evaporating 1000 lb. of water at the company's boiler plant. Address W. H. Walkup, superintendent, Batesville Water & Light Plant, Batesville, Ark.

Contract No. 48—New York—Sealed bids will be received by the Commissioner of Docks, Department of Docks and Ferries, until noon, Jan. 21, for furnishing and delivering coal. The amount of security required will be 30% of the total amount for which the contract is awarded, and deliveries are to be concluded in 90 days. Blank forms and further information may be obtained at the Department of Docks and Ferries, Pier A, foot of Battery Place, North River, Manhattan. R. A. C. Smith is Commissioner.

Contract No. 49—Harlan, Iowa—The Municipal Electric Light Plant of Harlan will be in the market for 2800 tons of coal about the first of next month. They commonly use Colfax (Iowa) steam coal, and the contract is let on a competitive basis, usually about Feb. 1. Address C. D. Lutton, superintendent, city of Harlan Light Plant, Harlan, Iowa.

Contract No. 50—Cleveland, Ohio—Sealed proposals will be received until noon Jan. 21 by the Commissioner of Purchases and Supplies for furnishing coal for the garbage reduction plant. Specifications and bid blanks may be obtained at the office of the Director of Public Service, Room 204, City Hall. A. R. Callow, Room 511, City Hall, is Commissioner of Purchases and Supplies.

CONTRACTS LET

Contract No. 28—Brooklyn, N. Y.—This contract (pp. 1009, Vol. 6, and 108, Vol. 7), which provides for furnishing and delivering anthracite coal to the various public buildings, baths, courts and comfort stations, Borough of Brooklyn, under Schedules Nos. 1, 2 and 3, has been awarded to Thomas W. Woods' Sons. Address Bureau of Public Buildings and Offices, Room 1003, No. 50 Court St., Borough of Brooklyn, New York.

Contract No. 30—New York—This contract (pp. 1009, Vol. 6, and 108, Vol. 7) has been awarded to Charles D. Norton Co., at $2.21 per thousand pounds. Address Department of Parks, Municipal Building, Manhattan.

Contract No. 35—New York—This contract (pp. 1048, Vol. 6, 108, Vol. 7), which provides for furnishing 7000 tons No. 1 buckwheat, 700 tons pea coal, 800 tons No. 1 buckwheat and 750 tons No. 1 buckwheat, has been awarded to Charles D. Norton Co. Address the Auditor, Bellevue Hospital, 400 E. 29th St., New York City.

Contract No. 36—Pittsburgh, Penn.—This contract (p. 1048, Vol. 6), which provides for furnishing the state penitentiary with its fuel supply for one year, has been awarded to the Youghiogheny Coal Co., of Pittsburgh, Penn. The grade used is nut and slack and deliveries are to be made at the rate of 20 to 35 tons per day, depending upon the season of the year. Address John Francies, Warden, Western Penitentiary of Pennsylvania, Pittsburgh, Pennsylvania.

Contract No. 37—New York—This contract (p. 1048, Vol. 6), has been awarded to the Consolidation Coal Co., Inc., 14 Wall St., New York. The bids were as follows: For furnishing and delivering 150 tons of bituminous coal in Manhattan, $1155; for 150 tons in the Borough of Brooklyn, $1230; for 25 tons in the Borough of Richmond, $190. For furnishing and delivering 75 tons in the Borough of the Bronx, the Consolidation Coal Co. and Olin J. Stephens bid alike at $577.50, and there has been no award on this section of the contract. Address Robert Adamson, Fire Commissioner, Fire Department, 11th Floor, Municipal Building, Manhattan.

CONTRACT NOTES

The Consolidation Coal Co., Cumberland, Md., has recently received a contract to supply 60,000 tons of Fairmont 1½-in. double screened West Virginia steam coal to the Egyptian State Rys.

The Highland Creek Coal Sales Co. is reported to have received a small contract from the Egyptian State Ry. calling for 5000 tons of coal to be delivered during the months of December and January.

Financial Department

The Colorado Fuel & Iron Co.

President J. F. Welborn reports, in part*, for the year ended June 30, 1914, as follows:

Gross earnings from operation were $17,803,025.21, a reduction of $6,512,862.50 as compared with the previous year. The reduction in sales of iron and steel was $3,505,497.93 and of fuel, $3,007,364.57. Operating expenses were $16,729,255.25 and net earnings from operations $1,073,796.69, being a reduction of $2,546,496.38. Of this decrease, $1,325,176.19 occurred in the iron department and was due primarily to the general curtailment of steel business throughout the country. The decrease of $1,221,320.19 in the fuel department was caused mainly by the direct and indirect effects of the strike, though without the strike there would have been a substantial reduction in these earnings. Income from other sources was $577,477.39, making a total net income of $1,651,247.35. Bond interest, taxes, sinking funds and other charges against income amounted to $2,557,215.78, resulting in a deficit of $905,968.43.

STATEMENT OF PRODUCTION FOR YEARS ENDING JUNE 30

Short Tons—	1913–14	1912–13	1911–12	1910–11
Coal	2,428,992	4,091,667	4,038,852	4,233,756
Coke	535,274	784,627	777,993	753,192
Iron ore	614,039	853,878	813,728	841,699
Limestone	376,226	485,756	459,913	425,704
Pig iron produced	268,883	416,467	426,659	397,701
Finished iron and steel	352,929	458,521	485,743	424,421

RESULTS FOR YEAR ENDING JUNE 30

	1913–14	1912–13	1911–12	1910–11
Iron department	$12,085,037	$15,590,535	†$15,140,523	†$13,775,664
Fuel department	5,717,988	8,725,353	†9,127,929	†9,159,021
Total gross earnings	$17,803,025	$24,315,888	$24,268,452	$22,934,685
Iron department	$1,569,288	$2,894,464	$2,766,775	†$2,502,566
Industrial dept. (fuel)	loss 495,518	725,802	†1,005,507	†975,783
Total net earnings	$1,073,770	$3,620,266	$3,772,282	$3,478,349
Add—inc. from secur	391,229	563,439	526,270	535,672
Interest and exchange	186,248	192,190	150,423	135,927
Total net income	$1,651,247	$4,375,895	$4,448,975	$4,149,948
Deduct—				
Bond interest	$2,021,103	$2,026,780	$2,039,622	$2,091,610
Taxes	293,580	243,722	226,737	214,785
Real estate	90,221	142,531	138,317	151,263
Insurance, sociological, personal injury, etc	55,128	50,082	64,105	233,602
Equipment renewal	43,016	120,000	120,000	128,106
Loss on Col. and Wyo. Ry				b10,005
Loss on Crystal R. RR	36,000	36,000	36,000	36,000
Prospecting	18,168	29,588	22,965	24,904
Preferred dividends	c	c(4)80,000	(5)100,000	
Total deductions	$2,557,216	$2,728,703	$2,747,745	$2,890,276
Balance, sur. or def	df.$905,969	sr.$1,647,192	sr.$1,701,229	sr.$1,259,672

b Includes traffic contract guaranty at $25,000 per month ($300,000), less earned from traffic, as per contract for year, $289,995 in 1910-11 and $105,309 in 1908–09. c The dividend above deducted in 1912–13 is the 4% ($80,000) paid July 1, 1913; there was also declared at the same time a dividend of 4%, which was paid Jan. 1, 1914, and deducted from profit and loss. An extra payment of 35% ($700,000) was also made Mar. 20, 1913, on account of the 74% then accumulated dividends, leaving about 39% still due.

† Figures so marked are inaccurate, comparison being changed in later years, the general results for the year, however, remaining unchanged.

BALANCE SHEET JUNE 30

Assets—	1914	1913	Liabilities—	1914	1913
Properties and sec. Equipment	$62,677,522	$62,210,218	Common stock	$34,235,500	$34,235,500
			Preferred stock	2,000,000	2,000,000
			Funded debt	x45,158,000	45,266,000
Cash on hand	3,793,195	5,280,426	Accts. and bills pay	857,585	954,982
Stocks and bonds	15,365,170	15,282,450	Hospital	15,125	23,156
Accts. and bills rec	3,232,136	3,749,457	Accrued bond interest	829,775	831,574
Subsidiary cos.	278,388	140,911	Tax payment fund	100,000	100,000
Manufac. stocks, etc.	3,158,989	3,075,831	Pref. dividends		80,000
Stripping, etc.	20,041	18,759	Sink. fd.—real est.	1,573,292	1,483,071
Accr. divs. and int.	139,857	84,062	Miscell. funds.	315,314	287,719
Miscellaneous	155,288	152,128	Profit and loss	y3,735,995	4,732,240
Total	$88,820,586	$89,994,242	Total	$88,820,586	$89,994,242

x Includes Col. Fuel & Iron Co. 5% gen. mortgage bonds, $5,678,000; Col. Fuel Co. 6% gen. mortgage bonds, $200,000; Grand River Coal and Coke Co. 6% 1st mortgage bonds, $860,000, and Col. Industrial Co. 5% 1st mortgage bonds, $38,420.

y After deducting $80,000 dividends on the preferred stock paid Jan., 1914, and sundry amounts (net) $10,277.

*President Welborn's report was largely concerned with a review of the labor troubles in which the company has been involved. This having already been covered in considerable detail in this journal, it has been omitted here.—Ed.

CONSOLIDATED BALANCE SHEET JUNE 30

Assets—	1914	1913	Liabilities—	1914	1913
Iron, etc., lands	$53,989,009	$54,862,468	Common stock	$34,235,500	$34,235,500
Equipment, etc.	29,076,517	28,592,342	Preferred stock	2,000,000	2,000,000
Railroads	5,811,908	5,810,427	Funded debt—		
Cooperage plant	31,263	30,468	Gen. M. 5s	5,678,000	5,638,000
Timber lands, etc	87,915	84,000	Colo. Fuel 6s	200,000	240,000
Store buildings, etc	435,922	425,273	Colo. Ind. Co. 5s	33,332,000	33,437,000
Telegraph system	54,300	54,300	Rocky Mtn. 5s	483,000	483,000
Inventories, etc.	3,881,120	3,865,644	Gr. Riv. Coal 6s	860,000	863,000
Accts. and bills rec	2,857,258	3,277,022	Pueblo Realty Tr. Co. 6s	503,098	505,398
Cash	4,073,853	5,563,138	Accts., etc., payable	1,655,703	1,952,272
Stocks and bonds	473,095	473,710	Accr. bond int.	833,800	835,500
Cash (trustees)	25,176	8,278	Accrued taxes	113,500	113,500
Reserve funds	98,841	99,341	Preferred dividend		80,000
Accrued interest	16,113	16,487	Balance	21,069,289	22,827,646
Royalties in adv	51,600	48,015	Total	$100,963,890	$103,210,915
Total	$100,963,890	$103,210,915			

Note—For the previous annual report of this company see Vol. 5 p. 550.

Virginia Iron, Coal & Coke Co.

President John B. Newton reports, in part, for the year ended June 30, 1914, as follows:

The mines have produced 1,988,000 tons of coal at a profit of $449,775 as against 1,840,213 tons at a profit of $353,655 the preceding year.

The modern all-steel tipple at Toms Creek colliery has been completed and in every way fulfills our expectations in improved facilities for handling a steadily increasing production. Further to increase the efficiency of this colliery, we are constructing a washery with a capacity for washing 2000 tons of slack coal per day to wash the slack from which your coke is manufactured, thereby improving substantially the quality of same. We expect to complete this plant by Dec. 1.

EARNINGS FOR YEAR ENDING JUNE 30

Operation of—	Year 1913-14 Gross	Year 1913-14 Net	Year 1912-13 Gross	Year 1912-13 Net
Furnaces	$1,743,405	$11,075	$1,986,679	$185,828
Foundries and shops	95,293	def. 7,689	102,555	1,182
Coal mines	1,815,190	449,775	1,616,465	353,655
Coke ovens	428,341	28,561	444,729	35,861
Saw mills	150		296	
Grist mills	180,129	6,689	180,539	5,304
Total	$4,262,508	$488,111	$4,331,263	$581,830

INCOME ACCOUNT

	1913-14	1912-13	1911-12	1910-11
Net earnings from operation	$488,411	$581,830	$278,517	$336,23c
Farms and farm rentals	3,351	16,145	9,822	6,187
Miscell., mdse., dis., etc	20,348	18,922	23,820	29,318
Total net income	$512,110	$616,897	$312,159	$371,740
Deductions—				
Taxes	$61,225	$57,337	$57,069	$50,500
Bond interest	259,856	262,688	264,513	265,638
Insurance	34,049	28,191	23,792	22,348
Expenses of idle plants	68,317	71,439	65,490	51,758
Depreciation of idle plants	122,516	126,359	91,155	60,691
Depreciation of active plants			29,048	53,594
Interest and discount	73,484	103,160	112,809	90,519
Dead rents and contracts	2,433	2,674	13,111	14,190
Miscellaneous	75	302	168	245
Development	7,761	2,838	28,044	25,044
Total deductions	$629,716	$634,988	$685,199	$634,527
Loss for the year	$117,606	$38,091	$373,040	$262,787

Operating, etc., accounts were charged during the year with $349,737 for depreciation, viz.: Depreciation of coal lands, $120,729; depreciation of ore lands, $4066; depreciation of improvements to leased properties, $53,730; depreciation of improvements to owned properties, $171,108; depreciation of quarries, $104; also with furnace repairs, $31,985.

BALANCE SHEET JUNE 30

Assets—	1914	1913	Liabilities—	1914	1913
Real est. & plant	$12,420,405	$12,595,009	Capital stock	$10,000,000	$10,000,000
Equipment	476,738	411,147	First mtge. bonds	4,787,000	4,835,000
Securities owned	197,363	197,363	Prior lien bonds.	384,000	398,000
Sales ledger bal.	351,118	747,169	Unpaid vouchers	249,281	251,806
Bills receivable	82,055	104,142	Unpaid pay-rolls	54,887	89,132
Cash	50,302	57,346	Accts. payable	8,509	9,850
Materials	2,169,939	1,753,755	Bills payable	1,683,855	1,522,056
Miscellaneous	86,832	95,401	Interest accrued	84,517	85,292
Profit and loss	1,378,517	1,229,804	Furnace-repr. fd.	11,220	
Total	17,213,269	17,191,136	Total	17,213,269	17,191,136

Note—For previous annual report of this company see Vol. 5, p. 112.